

FOR CONSIDERATION ONLY.

A DRAFT  
OF PROPOSED CHANGES  
IN THE  
Public and High School Courses of Study and Organization  
AND IN THE  
Departmental Examination System.



EDUCATION DEPARTMENT, ONTARIO, APRIL, 1903.

TORONTO :  
PRINTED AND PUBLISHED BY L. K. CAMERON,  
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THE ONTARIO INSTITUTE  
OF STUDIES IN EDUCATION

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# PUBLIC SCHOOL COURSE OF STUDY.

1. All the subjects prescribed for Forms I.-IV. of the Public School course are obligatory except where otherwise specified. No deviation from this rule is permissible without the concurrence of the Inspector, who shall also decide as to the optional subjects. When, from any cause, teachers properly prepared to teach the courses in Color and Art, Constructive work and Mechanical Drawing, and Nature Study, are not available, the Inspector shall authorize such modifications of the courses in these subjects as he may deem expedient.

2. Lists of works suggested for Supplementary Reading etc. (referred to in the programme of study) will be provided by the Education Department.

3. (1) The following subjects of the Fifth Form course of study are obligatory : Reading, Literature, Grammar, Composition, History, Geography, Penmanship and Arithmetic. From the other subjects of this Form, Boards of Trustees may select, with the concurrence of the Inspector, such subjects or such parts of the courses therein, as may, in their judgment, suit the requirements of their localities.

(2) Classes in Latin, Greek, French, and German may be provided in Fifth Forms, or Continuation classes, with the concurrence of the Inspector, and with a time table approved by him. Teachers of these subjects shall possess the same qualifications as are required in the High Schools.

4. When candidates for teachers' non-professional certificates take up the work or part of the work prescribed therefor, in Fifth or Continuation classes, the equipment and the time table provided shall be subject to the same regulations as in the High Schools ; and the qualifications of the teachers of such classes shall be the same as those of the teachers of the High Schools.

## FORM I.

READING.—First Readers, Parts I. and II.; Phonic Readers ; Supplementary Reading—books and selections of corresponding grade (see list) ; analysis and synthesis of words by sound and by letter.

NOTE.—In all forms special attention should be given to articulation and expression. The reading should from the first be both intelligent and intelligible.

SPELLING.—Transcription ; dictation and oral spelling of phonic words ; dictation from selected sentences ; careful attention to spelling in all written work in language, nature-study, etc.

LITERATURE.—Myths, fairy stories and fables (see list) ; stories and poems (*a*) illustrating nature study lessons, and (*b*) appropriate to the time of the year and to the various holidays ; learning and reciting of literary gems (see list).

COMPOSITION.—Oral and written statements in connection with form and color study, nature study, etc. ; oral and written reproduction of stories told or read ; description of actions, events, etc., within the learner's experience or knowledge ; transcription from readers with attention to capitals, spelling and punctuation ; correction of common errors in conversation.

HISTORY.—Stories of primitive peoples : The ancient Britains, the North American Indians and Eskimos stories relating to their mode of life, occupations and customs. Incidents and stories relating to our holidays.

GEOGRAPHY.—Observation of particular forms of land and water, as hills, valleys, ravines, streams, ponds, etc., in the neighborhood of the school ; location of objects observed ; general notion of position and direction ; observation of the effects of weather and water action ; systematic trips to places of geographical interest near the school ; winds, direction, effects on atmosphere in bringing heat and moisture ; sun, observation of the progress of the sun from sunrise to sunset ; moon, observation of position and appearance.

NOTE.—In its early stages geography should be but a phase of the observational work in nature study.



**ARITHMETIC.**—Systematic numbering to 1000's, grouping and separating; measuring in connection with objective work; common units of measurement within the child's experience, as inch, foot, yard, square inch, pint, quart, gallon, peck, cent, dollar, square inch, ounce, pound, day, week, month, year; addition and subtraction of small numbers.

**NOTE.**—The need to use number will frequently arise in the nature work and other exercises of the class room. The required numerical relations should then be made definite. In this way, with or without figures, many of the analyses and syntheses of the numbers as far as ten will be learned practically. At each stage arithmetical problems should be made to grow out of and be connected with the child's experience.

**PENMANSHIP.**—Instruction in form and movement at the blackboard; the writing of small letters and figures on paper; elementary exercises in movement.

**COLOR AND ART.**—Color and freehand expression.

**The Spectrum.**—Six standard colors with their shades and tints.

**Blackboard and pencil drawing (free movement).**—Simple natural objects and large objects in which children are interested as toys, dolls, etc.

**Water colors or colored crayons.**—Simple grasses, leaves, flowers, fruits, birds pet animals, etc., studied in nature work.

**Color and pencil or ink illustration of stories, study of pictures.**

**NOTE.**—Drawing, as a means of expression, should be connected closely with nature work, hand work, history, and literature. Many pictures should be used, and each subject should be illustrated with the child's free expression.

**CONSTRUCTIVE WORK AND MECHANICAL DRAWING.** — *Paper Folding.*—(1) To square a piece of paper. (2) To fold and stitch a book. (3) Window. (4) Window with shutters. (5) Envelope. (6) Picture frame. (7) Hat. (8) Wall pocket. (9) Boat. (10) Card basket. (11) Tent. (12) Windmill.

The more advanced Kindergarten folds afford excellent opportunities for this kind of work, and many articles other than those mentioned may be made, such as various shaped tents, crowns, pockets, purses, bellows, etc. The following geometrical figures may also be made by accurate folding: square, equilateral triangle, octagon, pentagon, and hexagon.

*Paper Cutting and Ruler Drawing.*—Teach rule by taking strip of paper eight inches long by 1 inch wide and folding it into half, quarter, up to eight divisions. At first no smaller divisions than inches should be used.

*Construction of Models.*—(1) Square box. (2) Rectangular box. (3) Cube. (4) Handkerchief box. (5) Folded box. (6) Button box. (7) Basket. (8) Square tray with sloping sides. (9) Egg box. (10) Wall pocket. (11) Court plaster case.

*Elementary Design.*—Construction and repetition of simple units

**NOTE.**—It is most important that the aims of this section of the work should be clearly understood. It fulfils a two-fold purpose; first, as an auxiliary to free drawing, particularly in the matter of execution; second, as teaching the fundamental principles of design by repetition of simple units. It is advisable in Form I. to provide paper squared in  $\frac{1}{4}$  inches, which should be afterwards discontinued. The aim is not so much to teach how to draw—that is being provided for in free drawing—as to apply what has been learned. After working each exercise the children should be encouraged to make other arrangements of the same elements.

*Clay Modelling.*—This should be so treated as to become an aid to conception of form. It should also be co-related with Nature Study.

(1) Natural objects, as orange, apple, onion, tomato, potato, egg, simple leaf.

(2) Common objects, as box, bird's house, small loaf of bread, cup (without handle) and saucer, flower pot and saucer, basket, tea set and tray.

In the above, all modelling should be done from the actual object, as many being provided as will enable each child to make a thorough examination.

(3) Free modelling.

Under this head the children should make what they wish, and should be encouraged to invent forms and patterns for themselves.



*Basket and Raffia Work.*—The making of table mats, napkin-rings, dolls' hats work baskets, porch mats, etc.

PHYSIOLOGY AND HYGIENE.—Observations of the body, parts, structure and movements. Simple lessons on the organs of the special senses, how they are trained and cared for. Care of hair, teeth, skin, and nails. Simple lessons on eating, drinking, breathing, and sleeping.

NOTE.—Physiology and Hygiene should, as far as possible, be made a phase of the observational work in Nature study.

NATURE STUDY.—Animal Life : Habits of pet animals, their care and food ; domestic animals on the farm, their care, habits and uses ; birds, their nesting, song, food, migrations in the autumn ; metamorphosis of a few conspicuous butterflies or moths.

Plant Life : Work in school garden ; study of a plant, as a geranium or pansy, from slip or seed to flower ; caring for plants in pots ; buds, their preparation for winter, their development ; autumn leaves, collection, forms, tints ; economic fruits, collection, forms, how stored for winter, fruit as seed holders, dissemination of seeds ; roots and stems, comparison of fleshy forms uses, how stored for water.

Life on the Farm : Harvesting, primitive and modern methods compared ; preparation for winter ; the barn and its uses ; activities of the farm during winter ; winter sports and social life on the farm ; the varied operations of spring time.

Observations of rain, snow, and frost ; spring time as awakening to new life, effects of sun and moisture on the soil.

NOTE.—From the character of Nature Study, the course therein must be more or less elastic, and a selection should be made therefrom subject to the approval of the Inspector. The acquisition of knowledge should be secondary to the awakening and preserving the pupil's interest in nature, and to training him to habits of personal observation and investigation. The topics are suggested as suitable ones from which a course which will meet the conditions of the school may be selected ; but the treatment must be suited to circumstances, age, and experience of learners, and to the seasons of the year, accessibility of materials, etc.

MUSIC (optional).—Rote singing.

## FORM II.

READING.—Second Reader ; Supplementary Reading (see list of selections in literature). Phonic Drill.

(See note under Form I.)

SPELLING.—Dictation from assigned passages in Readers ; careful attention to spelling in all written exercises ; easy words in common use.

LITERATURE.—Literature suited to the interest and the capacity of pupils (see list) ; learning and reciting of suitable selections (see list).

COMPOSITION.—Uses of the terms, sentence and paragraph, in connection with reading lessons and written exercises. Oral and written compositions on topics connected with nature work, geography, history, etc. ; reproduction of stories told or read ; description of familiar places, objects or pictures ; simple letter writing ; attention to the correctness of the English in conversation and in all oral and written exercises ; proper use of common punctuation marks.

HISTORY.—Classical myths and stories (see list) : stories of ancient world, Egypt, Assyria, Babylonia, Judea, Bible stories (see list of books and selections) ; stories connected with pioneer life, especially of the past of the district in which the school is located ; stories of early discoverers, explorers and military leaders : Norsemen, Columbus, the Cabots, Champlain, Jesuits, Jacques Cartier, Wolf, Montcalm, Tecumseh, Brock, etc.

GEOGRAPHY.—Continuation of local land and water forms : Relief, drainage, coast forms, simple characteristics from local forms. Construction of local maps by drawing, modelling, etc. World as a whole : Form ; size ; rotation, cause of day



and night ; heated and lighted by the sun. Surface : Land forms, continent and island. Water forms : Oceans. Local commerce : Articles of exchange, collecting and distributing centres, means of transportation, routes. Observation on weather : Winds, direction, force ; clouds ; rainfall, frost, changes of seasons, characteristic features of each season, etc. Systematic weather records. General notions of climate. Records of moon's phases, with drawings of their appearance. Water supply and sources of food in urban centres.

ARITHMETIC.—The grouping and separating of numbers continued ; notation and numeration to 1,000,000's. Addition and subtraction continued ; relation of wholes to parts and parts to wholes ; measurements continued ; multiplication and division, use of arithmetical signs, and fractional forms in expressing simple relations ; Roman notation to one hundred ; mental arithmetic.

PENMANSHIP.—Correct position. Movement exercises. Small letters and capitals. Spacing and joining. Copy-books authorized for the form, or graded exercises prepared by the teacher and approved by the inspector.

COLOR AND ART.—Color and freehand expression. Study of color continued. Free drawing of plants and other common objects ; pencil sketches of common animals. Water colors : Fall flowers and leaves emphasizing brilliant autumn tints ; butterflies and other insects ; live or mounted birds ; fish, etc. Memory, imaginative, and illustrative drawing. Study of pictures.

CONSTRUCTIVE WORK AND MECHANICAL DRAWING.—*Paper Folding and Cutting.*—Based on the square, rectangle, triangle, circle, octagon and hexagon. All folding and cutting should be carried on with some definite object as the result. The teacher should first fold large sheets of paper, then draw folds on the black-board, the children folding from the drawing. Articles which may be used are as follows :—

(1) Wall box. (2) Chair. (3) Bench. (4) Dog house. (5) Equilateral triangle. (6) Octagon. (7) Triangular candy box. (8) Circle maker. (9) Circular mat. (10) Twine holder. (11) Woven basket. (12) Easel.

*Ruler Drawing.*—General practice in ruler-drawing of lines of different dimensions and in various directions, the paper not being turned. These lines should be combined so as to give some definite result.

Mechanical drawing of common straight-lined objects such as box, brick, picture frame, easel, flag, spade, etc. Draw full size at first (if possible), and afterwards to half scale. Teach the use of half and quarter scales.

Use of 45 degrees set square and compasses. Lines at 45 degrees and 90 degrees parallel and combined. Circles of different radii and in combination. Correct technical terms.

*Cardboard Cutting and Modelling.*—Simple objects based on geometric forms, cut from thin cardboard. (1) Triangular mat. (2) Square mat. (3) Hexagonal mat. (4) Hexagonal star mat. (5) Octagonal mat. (6) Eight pointed star. (7) Triangular tray. (8) Triangular paper holder. (9) Basket. (10) Hexagonal tray. (11) Hexagonal plate holder. (12) Octagonal plate holder. (13) Semi-octagonal wall box.

*Elementary Design.*—Simple design—straight line and easy curves. Accurate sub-division of spaces. This feature of the work should always have some object in view to which the design is to be applied, such as tiles, book-covers, borders, etc. After the unit has been drawn it should be repeated a number of times to fill a given space. The use of the ruler and set square combined will materially lighten this part of the work and add to its efficiency. All the examples should be drawn to a fairly large scale.

*Clay Modelling.*—

(a) Natural forms : Apple, beet, banana, leaf, apple and twig, etc.

(b) Common objects : Cup, with handle, and saucer, flower pot, bat, piece of coal, etc.



(c) Free modelling.

*Basket and Raffia Work.*—Construction work continued ; source, kinds and uses of wicker and raffia.

*Needlework.*—Simple stitches ; sewing on buttons and hooks ; simple mending.

PHYSIOLOGY AND HYGIENE – Course of Form I. continued. Functions and care of the more important parts of the body. Special uses of the bones of the body, how injured. Effect of tobacco and alcohol on bones. Simple lessons on digestion and the circulation of the blood. Effects of tobacco and alcohol on digestion and circulation. Simple lessons on respiration and necessity for ventilation.

(See note under Form I.)

NATURE STUDY—Course of Form I. continued. Animal Life. Life history and habits of domestic animals and familiar wild animals, as squirrel; earth-worm, habits, structure, uses; toad, habits, structure, uses; observation of live insects and their activities, comparison of young and adult stages.

Plant Life : Cooperative and individual work in school garden; cultivation of plants in pots with observation of the development of leaves and flowers; parts of leaves and flowers; change of flower to fruit and fruit to seed; functions of the parts of flowers; the forms and uses of trees; activities connected with forestry and lumbering, connect with study of pioneer life and present conditions on the prairie.

Different kinds of soil, as sand, gravel, loam, leaf-mould, and clay; experiments to ascertain how soils are composed, whether of mineral or of decayed organic material, and which best retains water; additional phenomena of spring in the vicinity of the school, cause of melting snow, floating ice, etc.; how nature prepares the soil for growth of plants.

Observation of farm, garden and household operations.

(See note under Form I.)

MUSIC. (optional).—Note singing continued ; easy notation

### FORM III.

READING —Third Reader. Supplementary Reading. (See list of selections in literature.) Exercises in breathing, articulation, and vocalization.

(See note under Form I.)

SPELLING.—Dictation from passages selected from readers and other books. Words in common use. Careful attention to spelling in all written exercises, particularly in composition.

LITERATURE.—Books suited to the interest and capacity of the pupils (see list); learning and reciting of suitable selections. (See list.)

COMPOSITION.—Oral composition continued. Narrative, descriptive and epistolary composition of several paragraphs; business forms, such as bills, receipts and promissory notes. Attention to correctness of English in conversation and in all exercises. Punctuation and abbreviations.

The simple sentence: subject and predicate. The assertive, interrogative, imperative, and exclamatory forms of sentences. Gender, case, and number forms. Direct and indirect narration.

HISTORY.—The course of Form II. continued. Conversations on British and Canadian history. Simple illustrated narratives. A simple account of the forms of government in the Dominion and in Ontario, and of the duties of citizenship.

GEOGRAPHY—The course of Form II. continued.

*The earth as a whole*—The earth in space : Observation of phases of the moon; relation of the earth and moon to each other and to the stars ; rotation of the earth, direction, time and rate, effects ; revolution of the earth, path, direction, time and



effects ; general observation of stars, difference between fixed stars and planets ; observation of position of north star. Necessity and use of imaginary lines ; great and small circles, latitude and longitude. Relief : world slopes. Drainage : world water partings, world basins, world river system. Continents : Locations, relief, drainage and coast line of each continent. Local, physical and political geography : Relation of township, town or city to county, of county to province, of province to country, position of country in continent. Observation and description of the occupations of men and of local industries, emphasizing those that are typical. Collection of pictures, sketches, materials and products. Dependence of local industries on soil, mines, commerce, etc., and consequent localization of settlement, routes of travel, etc.

*North and South America.*—Location and surroundings, form, coast line, relief, drainage, climate, political divisions ; special conditions which determine and affect various industries, as agriculture, grazing, lumbering, mining, hunting and manufacturing ; comparison of representative sections with reference to vegetable and animal life, and social conditions and progress of peoples ; comparison of typical commercial centres, noting the sources of their wealth and power ; the relation of climate to labor and production. water power, methods and routes of distribution and transportation.

*Canada.*—Study of the Dominion as a whole and in sections with more particular study of Ontario.

**ARITHMETIC.**—Notation and numeration reviewed and continued. Practice to secure accuracy and a reasonable degree of rapidity in fundamental operations. Application of fundamental processes to problems of daily life. Standard units and tables, including metric system. Reduction processes and compound rules. Relation of parts to wholes and wholes to parts continued ; simple fractions and decimals in connection with money and units of metric system.

**PENMANSHIP.**—Course of Form II. continued. Copy-books authorized for the grade, or graded exercises prepared by the teacher and approved by the inspector. Business forms.

**COLOR AND ART.**—Drawing of plants, insects, etc., in any appropriate medium. Arrangement in spaces, applications in borders, surface patterns and rosettes in color. Study and draw details of Greek ornament and vase. Water color : Course of Form II. continued. Simple landscapes from window or out-of-doors. Study of pictures.

**CONSTRUCTIVE WORK AND MECHANICAL DRAWING.**—*Use of Rule, Etc.*—Construction and use of simple scales (1" to 1 ft., 2" to 1 ft. 1½" to 1 ft) and drawing lines of different lengths. Scales should afterwards be drawn on stout paper, cut out and used in the making of simple drawings to scale.

Compass work on thin cardboard made into useful objects, such as book marks, table mats, calendar mounts, yarn winders, card baskets, etc.

Use of 60 degrees per square ; comparison of 45 degrees ; their use singly and in combination.

*Geometrical Construction.*—Right angle, square, rectangle, equilateral triangle, hexagon, octagon cut to shape. Correct technical terms should be taught and plenty of drill given. Comparison of the figures as to size, lines, angles, etc.

*Development of Solids from Cardboard.*—Cube, triangular prism, hexagonal prism, cylinder, cone, square pyramid, etc. The lines of fold should be lightly scored and bent away. The models may be completed by tying or leaving flaps to be pasted.

*Design.*—Study of units, combination of units, accurate subdivisions of fields of design into polygons, modification of units for objects of beautiful line. Ruler, set squares and compasses should be freely used, and the originality of the pupils allowed full play. Spaces should be filled in to give the idea of mass, and colour may be advantageously used.

*Basket and Raffia Work.*—Course of Form II continued



*Needlework.*—Plain hemming and back-stitching ; making buttonholes ; fine mending.

PHYSIOLOGY AND HYGIENE.—The course of Form II. continued, with more special study of the growth, waste, and renewal of the body, and the effects of narcotics and alcohol on the various processes. Shape, use, and action of muscles. Effects of exercise ; best kinds of exercise ; best time for exercise. Comparison of the more important parts of the human body with those of the bodies of other animals examined in nature work.

NATURE STUDY.—Course of Form II. continued.

Animal Life : Adaptation of different kinds of animals to their respective habits ; birds, life history of types, habits of wild fowl in different seasons ; fish, forms and uses of different parts of the body, food and how obtained ; life histories of moths, butterflies, beetles and grasshoppers ; useful insects, as ladybird and dragon fly ; harmful insects and methods of destroying them.

Plant Life : Germination of seeds under controllable conditions and in the school garden ; more particular study of the forms and functions of the parts of plants, and variations in these forms and functions in different plants ; observations on the culture of farm and garden crops and orchard and shade trees ; the observing and the distinguishing of the common forest trees.

Observing local minerals and rocks, their properties and uses ; experiments on different kinds of soil ; distinction between hard and soft, pure and impure water, tests and methods of purification of water.

Sources of heat : Experiments to show the effects of heat in the expansion of solids, liquids and gases ; practical applications. Temperature : Thermometer ; construction and graduation. Methods of transmission of heat, conduction, convection and radiation ; causes of winds and ocean currents ; ventilation.

(See note under Form I.)

MUSIC. (Optional).—Easy exercises in musical notation ; songs

## FORM IV.

READING.—Fourth reader. Supplementary reading. (See list of selections in literature.) Exercises in breathing, articulation, and vocalization.

(See note under Form I.)

SPELLING.—Dictation from passages selected from Readers and other books. Words in common use. Simple general rules for spelling certain English words. Careful attention to spelling in all exercises.

LITERATURE.—Books suited to the interest and capacity of the pupils (see lists); learning and reciting of suitable selections.

COMPOSITION.—Varied oral and written composition exercises. Special attention to correctness of spelling, punctuation, use of capitals, choice and form of words ; and to clearness, conciseness, freedom, and comprehensiveness of expression. Business correspondence and forms. Topical outlines. Critical attention to correctness of English in conversation and in all exercises.

HISTORY.—A brief outline of the most important events in Canadian and British history, especially during the nineteenth century. Supplementary reading and interesting biographical accounts of persons famous in Canadian and British history. A brief outline of the duties of citizenship and of the provision for civil government in Canada.

NOTE.—The chief object of the course should be to arouse an interest in historical reading and to give an acquaintance with those leading points in our history which every citizen should know. As there will be no departmental examination in this subject, the teacher will have greater freedom in dealing with the course.

ENGLISH GRAMMAR.—The sentence. Subject and predicate. Parts of speech. Phrases and clauses. Kinds of sentences. Classification and inflections of the parts of speech. The elementary principles of syntax. Analysis of simple sentences.



**GEOGRAPHY.**—Course of Form III continued. Observation of (*a*) some of the more prominent constellations as the Great Dipper, Orion, Cassiopeia, (*b*) planets visible in early evening.

*Climate.*—Distribution of light and heat ; observation of Sun's apparent movements through the year ; light zones, how determined, names, boundaries, variations in length of day and night ; heat belts, general location, cause of variation from light zones, boundaries, movements ; winds, cause, winds of torrid and temperate belts, land and sea breezes, peculiar winds, uses of winds. Ocean currents : general character, names and locations of those of chief importance, effects. Rainfall : amount ; how measured ; trace, where possible, the progress of storms by means of daily weather records and government weather maps ; regions of great rainfall ; deserts.

*Eurasia.*—Topics similar to those relating to North and South America outlined in course for Form III ; comparison with North America.

*Africa, Australia, and the continental islands.*—A brief study with reference to the principal physical and political divisions, productions, centres of population, resources, industries, conditions of people, routes of travel and commerce, more particular attention being given to the component parts of the British Empire.

**ARITHMETIC.**—Factors, measures, multiples. Fractional notation continued ; vulgar and decimal fractions. Application of arithmetical processes to simple business transactions as interest, commission, insurance, etc., etc. Mental arithmetic.

**NOTE.**—The processes and problems should be such as find *direct* application in ordinary business life. Rapidity and accuracy of work to be aimed at.

**PENMANSHIP.**—Course of Form III continued. Business forms, with special attention to the mechanical details of business practices. Copy-books authorized for the grade, or graded exercises prepared by the teacher and approved by the inspector. Pupils should be taught to be self-critical in respect to the qualities, legibility, beauty, and rapidity.

**BOOK-KEEPING (Optional).**—Single entry ; day book and ledger, including personal and cash accounts.

**NOTE.**—This course is intended for pupils who do not go beyond the Fourth Form.

**COLOR AND ART.**—The course of Form III continued. Adaption of natural forms to purposes of decorative design. Study and application of the application of good design. Freehand perspective.

**CONSTRUCTIVE WORK AND HOUSEHOLD SCIENCE (optional).**—*Manual Training.* Working drawings, construction of : (1) Wedge, bass or white wood. (2) Rectangular ruler, white pine, (3) sawing exercise, white pine, (4) Rect. flower stick, white pine or bass wood, (5) File handle bass or white pine, (6) Round ruler, mahogany or bass, (7) Marble board, white pine, (8) Key Rack, Bass wood or white pine, (9) Tip cat, soft maple, (10) Tooth brush rake, white pine or bass, (11) Pencil sharpener, pine, (12) Plant label, pine, (13) Sand paper block, bass, (14) Hexagonal teapot stand, bass or white wood, (15) Door button on bass, white pine, (16) Finger plate, soft maple, (17) Desk tray, set in walnut or red cedar, (18) Cube, pine, (29) Tip cat bats, soft maple, (20) Flower-pot cross, pine.

**NOTE.**—Particular attention should be paid to the preparation of working drawings by the student. These should be either full size or to a fairly large scale. English or metric systems of measurement may be used ; but, as in all scientific work the metric system is coming into general use, it is advisable to combine the two systems. The course outlined is graduated on the basis of tool manipulations, and is prescribed simply as a basis on which a scheme suitable to any locality may be adopted. It is advisable that as far as possible the subjects may be correlated with others by requiring pupils to construct simple pieces of apparatus, models, etc., for use in school-room demonstrations. Within the limits of his capacity the students also may be allowed from time to time to choose his own work. While the work may be thus varied it is advisable that the different exercises should require practically the same tool operations.

*Basket and Raffia Work.*—Course of Form III, continued.



*Needlework*.—Course of Form III continued ; cutting and making simple garments.

*Household Science*.—Uses, selection and care of kitchen equipment.

Proper care of the house ; sweeping, dusting, cleaning, etc.

The Human Body : A machine for doing work, nutrition, growth, waste, repair ; composition of body and of foods compared.

Foods : Function, necessity for variety, effects of cooking. Principles involved in different methods of cooking and application of various methods to foods to different character ; principles involved in making the staple food dishes.

Practical work in the economical preparations and serving of vegetables, vegetables, cereals, fresh and dried fruits, soups, eggs, meat, bread, baking powder and soda biscuits, simple salads and desserts, particular attention being given to cheap foods, cuts of meat and "left overs." Individual serving, setting of table. Hospitality and courtesy. Marketing.

PHYSIOLOGY AND HYGIENE.—The course of Form III continued. The composition and uses of the blood. Relation of blood to health. More special study of the organs of circulation and their functions. The composition and purity of the air. More special study of the organs of respiration and their functions. Effects of respiration on air and on blood. The relation of respiration to health with special reference to ventilation, disinfectants, exercise and clothing. How heat of body is generated. The vocal organs and their functions. Cultivation and care of the voice. The nervous system, organs and functions. Relation of nervous system to health with reference to exercise

NATURE STUDY.—Course of Form III. continued Animal life : Relation of fishes, birds and wild animals to man ; life histories of conspicuous and economic insects ; organ and functions. Plant life : study of organs of plants and their functions ; study of economic and wild plants from seed to fruit in the school garden, home garden, farm and forest ; weeds injurious to crops and methods of destroying them ; buds and twigs ; wood, rings, grain, and bark, uses, etc. Experiments to show composition of soils and their relation to drainage, temperature, etc. ; varieties of soils adapted to different crops ; fertilizers, etc. Implements and tools used on the farm and in the household, mechanical principles applied in their construction. The atmosphere, its composition. Combustion : simple experiments, study of candle flame products. Changes produced in the air by respiration. Reciprocal relation of plants and animals as regards the atmosphere ; impurities in air. Gravity : Air and liquid pressure ; the barometer. Cohesion and adhesion, the nature of these forces ; phenomenon of solution and diffusion ; amorphous and crystalline forms of matter. Practical use of heat, steam and electricity in connection with the study of industries.

(See note under Form I.)

*Music* (optional). — Course in Form III continued

## FORM V. AND CONTINUATION CLASSES.

READING.—Practice in oral reading, with exercises for cultivating clear, correct and expressive utterance in speaking, reading, and recitation. The principles to be learned incidentally.

(See note under Form I.)

LITERATURE.—Intelligent comprehension of suitable authors, both prose and poetry. The classwork should be supplemented by other suitable authors provided by the pupils themselves, and supplied from the school library and the public library. Memorization and recitation of choice selections in prose and poetry.

NOTE.—The object of the course should be the cultivation of a taste for good literature, not by minute critical study, but by reading at home and in school, aloud and silently, with due attention to the meaning, standard authors whose works will quicken the imagination and present a strong element of interest. Such authors should be chiefly narrative, descriptive and dramatic.



COMPOSITION.—Oral and written composition, chiefly narrative and descriptive. Letter writing. Oral and written reproductions or abstracts of lectures and of historical, geographical and other supplementary reading. Application of the principles of good English to the correction of mistakes made by the pupils in speaking and writing. The main principles of composition (rhetoric) should be learned incidentally from the criticism of compositions.

HISTORY.—The leading events of the history of Canada followed by the outline of British history, accompanied by supplementary reading and by interesting biographical sketches of persons famous in Canadian and British history. The elements of civil government and the duties of citizenship. Both written or oral reproductions or abstracts in connection with English composition.

NOTE.—The main purpose of the course at this stage is to train the pupils to grasp the leading events in their logical order, and to rouse an interest in historical reading. As soon as practicable a beginning should be made in appreciating the logical connection of events.

GRAMMAR.—The principles of etymology and syntax, including the logical structure of sentences and the inflection and classification of words. The elementary analysis of words with the most important Latin and Greek root-words. An elementary knowledge of the formation of the sounds of the language and their representation by means of the alphabet. The main facts in the history of the development of the language.

NOTE.—The use of English Grammar in teaching correct oral and written composition, though important especially towards the close of the course when the principles of good English can be intelligently applied, is secondary to the insight it gives into the structure of our thinking and expression.

ARITHMETIC AND MENSURATION.—Review of principles, measures, multiples, fractions (vulgar and decimal); extraction of square root; interest; discount; commission; stocks; insurance, exchange, mensuration of the rectangle, triangle, parallelogram, circle; the parallelepiped, the cylinder. Mental arithmetic. The metric system.

NOTE.—The processes and problems in the commercial work should be such as find direct application in ordinary business life. Rapidity and accuracy of work should be aimed at. In the mensuration rigorous proof of the more difficult formulas is not desirable.

ALGEBRA.—Elementary work, factoring, highest common factor and lowest common multiple, fractions, simple equations of one, two and three unknown quantities, square root.

GEOMETRY.—Definitions: basic geometric conceptions and principles, use of simple instruments, as compasses, protractor, graded rule, etc., measurement of lines and angles, and construction of lines and angles of given numerical magnitude; accurate construction of figures; some leading propositions in Euclidean plane geometry reached by induction as a result of the accurate construction of figures; deduction also employed as principles are received and assured. The course in Euclid begun.

NOTE.—The introductory course should emphasize physical accuracy as well as accuracy of thought, exactness in drawing lines of required length in measuring lines that are drawn, in constructing angles of given magnitude, and in measuring angles that have been constructed. The course in Euclid retains his common notions, regarding them from more modern standpoints.

COLOR AND ART.—Course of Form IV. continued.

Drawing from models in light, and shade and color. Memory drawing in both outline and shade. Simple principles of freehand perspective. Inventive illustrative drawing, ornamental design, using outline and color, and introducing practical geometry with its application to design.

CONSTRUCTION WORK AND HOUSEHOLD SCIENCE (optional).—*Manual Training*.—Course of Form IV. continued.—(1) Mortise and brace exercise, pine, (2) Fish line winder, soft maple or butternut, (3) Bridle joint, white pine, (4) Tent peg, soft maple, (5) Bench hook, red oak, (6) Sugar paddle, soft maple, (7) Bracket, white wood, (8) Hammer shaft, ash, (9) Battledore, white wood and black walnut, (10) Pen tray, birch or black walnut; (11) Tea-pot stand,



white wood, (12) Nailed box, pine, (13) Spade bale, red oak or ash. (14) Gate hook, oak, soft maple or birch, (15) Whistle, soft maple or cherry, (16) Letter file, oak, soft maple or birch, (17) Clothes peg, birch or ash, (18) Soap box, white pine, (19) Paper knife, soft maple or birch, (20) Egg stand, birch or cherry.

(See note under Form IV.)

*Basket and Raffia Work.* — Course of Form IV. continued.

*Needlework.* — Course of Form IV. continued; Introducing more difficult stitches as herringbone, feather stitch, hem stitch, overcasting, slip stitch, etc.; difficult mending; joining bias strips; gussets, gathering and stitching band.

*Household Science.* — Course of Form IV. continued.

*Classification of Food Principles* — (1) *Incombustibles* — (a) Water; sources, use in body and house; (b) Mineral matter; source, use in body.

(2) *Combustibles* — (a) Heat givers (Carbonaceous); 1. Carbonhydrates; starch, sugar; 2. Fats and oils; (b) Heat givers and flesh formers (Nitrogenous): Proteids; flesh foods, meal, fish, eggs, casein of milk and cheese, gluten of cereals, legumen of peas and beans.

**PENMANSHIP** — Correct position and movement; principles of letter formation; graceful, legible business hand; ledger headings; figures; letter writing; addressing envelopes and parcels.

**BOOK-KEEPING.** — Single entry and double entry. Use of journal, day book, cash book, bill book and ledger, the first two as books of original entry, and cash book with special column for merchandise on the debtor side and for expense on the creditor side; transactions, including discounts and renewals of notes and drafts, trade discounts, deposits in banks and the use of cheques; changing from single entry into double entry, and from double entry to single entry; sets in simple partnership; statements of assets and liabilities, and of profit and loss.

**BUSINESS FORMS.** — Receipts, promissory notes, chattel notes, drafts, bills of exchange, orders, due bills, deposit slips, cheques, bank drafts, bills, invoices, accounts, monthly statements, financial statements, indorsement and acceptance and consequent liability.

**STENOGRAPHY.** — The theory. Dictation and transcription.

**TYPEWRITING.** — Copying documents, transcription of shorthand notes, manifold, letter press copying. Touch system recommended.

**GEOGRAPHY.** — Soil, stones, rocks, strata, and their origin; nebular theory; stratified, unstratified, metamorphic rocks; elevation and depression of the crust of the earth, forming continents and oceans; periods in the earth's history in full relation to Canada, and to Ontario in particular; life on the earth, fossils. Forms and distribution of land masses, causes, theories regarding them; changes in land forms; agents of change, volcanoes, water, etc. Study of the common rocks, minerals and soils of the districts. Mountains, origin, growth, distribution, relation to mines, forests, and climate; volcanoes and volcanic phenomena; plains and plateaus — Canada generally, Ontario and the Northwest in particular; relation of Canadian upheavals, subsidences, glaciation, moraines, gravel ridges, boulders and formations, to the continental areas of which they form a part.

Rivers and river valleys; lakes; coast features; industrial importance of streams, rivers, lakes; origin and growth of rivers, falls and rapids; changes in courses with causes, older river courses, depression and elevation; erosion by rivers, transportation and deposition of sediment.

The ocean: origin, distribution, depth, movements, currents, tides, waves, ocean bed, etc.

The atmosphere, composition, importance to life, aqueous vapor; heating of the earth; depth of the atmosphere; high and low pressure, the barometer, isobars, etc.; movements of the air; winds, their causes, tradewinds, anti-tradewinds, periodic, variable, cyclones, anticyclones, thunder storms, tornadoes; clouds, rain, snow, dew, evaporation; climate, causes affecting it; former climatic conditions.

Life: varieties, dependence upon climate, soil, etc. Plant life, typical forms in



different zones, distribution; marine plants. Animal life, typical forms, terrestrial, aerial, marine; direct or ultimate dependence on plant life; distribution of forms; man, varieties, distribution, relation to investigation and other animal life and to natural and physical conditions.

The earth as a planet; the planets, the fixed stars; the celestial sphere; observations of some of the more prominent constellations; the solar system and its members; the earth, its size and shape, proofs of shape; circles on surface; latitude and longitude; zones; daily rotation on axis; proofs; day and night; yearly revolution; its orbit and ellipse; perihelion; aphelion; seasons; variation in the length of day and night; measurement of time; unit of time; sun-dial; civil year; standard railway time of Canada and the United States; location of position by latitude and longitude; calculation of times and distances.

The moon: rotations; phases; different kinds of months; various eclipses of the sun and moon; umbra, penumbra; appearance through a telescope; absence of atmosphere, clouds, etc.

The sun: sun spots, solar heat, radiation, etc. Comets, meteors, nebulae, etc.; their probable nature, number, revolutions, etc.; darkness and coldness of space.

Important commercial highways and their relations to centres of population. Natural and manufactured products of the countries of the world, with their exports and imports. Internal commercial highways of Canada and the chief internal commercial highways of the United States. Relation between industrial and commercial centres and physical features; relation of soil and underlying rock formations to the products of the districts, and occupations of the inhabitants. Water ways: their influence on population and settlement, their use as highways of commerce, with special reference to Canadian routes. Typical natural products of different zones. Commercial relations of Great Britain and her colonies, and of Canada and the United States. Forms of government in the countries of the world and their relation to civilization. Relation between the characteristics of a people and their environment.

NOTE.—Excursions, where possible and desirable, especially in connection with the study of rocks, minerals, soils and land formation of the district, and of the work of a stream, river or lake, all of which should be emphasized in due course.

#### ELEMENTARY SCIENCE.

NOTES.—(1). The objects of the course in Elementary Science are to give pupils who will not remain at school more than a couple of years a fair knowledge of the world around them, and to lay a foundation for the more detailed study of each subject in the case of pupils who will continue the course in Science provided in the Middle and Upper Schools of the High Schools.

(2). As the course in Elementary Science is a new one, and as there will be no departmental examination on it, full details are given for the guidance of the teacher. The general outline of this course shall be followed, but the extent of the details under each head is left to the principal and the teacher.

#### *First Course.—September to November.*

BOTANY.—Comparison of higher plants with higher animals; relation of each to food; means of obtaining and storing it; dependence of animals on plants. Relation of plants to light, moisture, and heat, with examples; water as a solvent, circulation in plants, experiments; soluble and insoluble material in soils; importance of each class of material to the plant; uses of roots and leaves in absorbing food from soil and air, experiments. Struggle for light and moisture, as shown by development of stems, leaves and roots. Uses of hairs, spines, prickles, tendrils and petioles. The simpler fruits and the means of dispersion of seeds. Formation of tree buds; preparation for winter; annuals, biennials, perennials. The fall of fruits and leaves of deciduous and evergreen trees. The study and interpretation of the marks on the twigs of trees and shrubs.

#### *April to June.*

The expanding of buds, and the opening of the spring flowers. The functions of flower, bud, leaf, stem, root, etc.; organs of flowers, their functions; pollination, fertilization; germination of the seed, development of the parts, examples—bean, morning-glory, pumpkin, corn. Propagation by offsets,



runners, tubers, slips, seeds, grafts budding. Review of the relations of light, heat and moisture to plants in germination. Objects of pruning trees, transplanting and thinning vegetables. Times of germination and flowering of common plants in their native situations. Conditions governing the growth of the early wild flowers. Modifications in plant growth suitable to environment. Plant societies in different localities. Comparison of spring and autumn flowers. Identification of plants with regular flowers by the aid of the Flora.

*Second Course—September to November.*

BOTANY.—Morphology of the composites, grasses, and sedges. Identification of the simpler ones. Study of plant societies continued: peculiarities of each which adapt it to its situation. Special study of weeds, means of controlling them. Morphology and identification of ferns. Parasitism and saprophytism. Study of plant enemies and remedial treatment—the simpler forms; examination of some common fungi and comparison with some forms of algae. Comparative study of fruits. Special study of leaf, its modifications and adjustments for securing a favorable light position; its importance in obtaining and elaborating food material; the part it plays in evaporation.

*Second Course—April to June.*

Continuation of the study of the local flora: the coniferae: study of the bud; form, permanence, and phyllotaxy of leaves; flowers; comparison of twigs and wood with those of other trees. Comparative study of pith and cortical layers. Distinction between endogen and exogen. Meaning, significance and methods of cross fertilization. Plants in their relation to man; man's influence on plants. Plant physiology—elementary and experimental; chlorophyll; movements of gaseous and liquid nutrients and waste products. Morphology of the catkin and other complex inflorescences. Study of the fungi continued: fungous diseases and their remedial treatment. Relation of plants and plant products to civilization, food, clothing, ornament, medicine; rubber, tea, spices, etc.

*First Course.—September to November.*

ZOOLOGY.—Relation of insects to flowers. Study of grasshopper, potato beetle, tomato worm, house fly and spider. The life history of at least two insects having complete metamorphoses. Collection of caterpillars infesting common plants for observation of their metamorphoses. Recognition of some of our common birds; observations on the habits and structure of birds, with a view to their classification as scratchers, swimmers, perchers, etc. Times of their migrations. Preparation of animals for winter.

*April to June.*

Adaptation of animals for securing food, avoiding enemies, surviving the winter, etc. The life history of the frog. Continuation of the study of the habits of spring birds, especially in regard to their methods of obtaining food and of nesting; suitability of feet, bills, color, nests, etc., to their habits of life; life history and habits of the tent caterpillar and any of the predaceous beetles. Observations upon any conspicuous orchard or garden pests of the season, with their remedial treatment.

*Second Course.—September to November.*

ZOOLOGY.—The mammalia, chief characteristics. Our native Canadian mammals; their adaptation to our climate; their coloration, docility, habits, food, enemies. Modifications for (1) aerial life (bat, flying-squirrel); (2) arboreal life (squirrel); (3) subterranean (wood-chuck); (4) aquatic (beaver, muskrat). Animals that hunt; animals that are hunted; peculiarities of each. Adaptation of the fish, the frog, the bird, the mammal, to their habits of life. Homologies of fins, scales, etc. Comparison of the teeth and integuments of a few typical animals. Winter homes of insects; stages in which insects survive the winter.



*April to June.*

Recognition of birds and insects continued ; their food supply ; those beneficial or injurious ; bills and feet as a basis of classification of birds. Mouths and wings as a basis of classification of insects. Distinction between biting and sucking-mouthed insects ; modes of exterminating them. Determination from examples of the chief characters of each of the large orders of insects. Life-history of any two of carpet-beetle, scale insect, saw-fly, codling moth, mosquito. Rearing these insects to study their metamorphosis. The remedial treatment of insect pests continued. Useful animal products : silk, wool, fur, leather, etc.

NOTE.—Class text books shall not be used. The course shall be, as far as possible, a practical one. When desirable, the agricultural applications of the subject should be emphasized. Systematic written description and drawing should be required throughout the course ; all these exercises should be dated and preserved for inspection and comparison. Each pupil should possess a good lens, and be taught how to use it. The compound microscope should be used regularly by the teacher for illustrations. Approved methods of collecting and preserving botanical specimens and of keeping live animals suitable for study should be systematically followed. An aquarium and herbarium, and a museum of local biological specimens should be provided where practicable. Much of the practical work, especially the observations, will necessarily be done out of doors by the pupils alone, under the direction of the teacher, or by the pupil, conducted by the teacher.

*First Course —November to April.*

PHYSICS.—Forms of matter : solids, liquids, gases ; different states of the same kind of matter : crystalline and amorphous conditions : theory of constitution of matter. Metric units and standards of length, area, volume, weight, mass, density ; experiments in measurements with use of instruments, such as rule, balance, burette, caliper, (simple and micrometer screw). Properties of solids : hardness, malleability, ductility, tenacity, elasticity, plasticity. Properties of bodies which give them value in arts. Properties of liquids ; fluidity and viscosity ; cohesion and adhesion in liquids ; phenomena of capillarity ; part played by capillarity in nature ; transmission of pressure by liquids ; illustrations ; construction and uses of hydraulic press. Relation of pressure to depth and density ; pressure at a point equal in all directions ; the surface of a liquid at rest is horizontal ; meaning of the term *level* ; construction of the water level and spirit-level ; methods of distribution of water supply in cities and towns ; buoyancy and floatation. Properties of gases : weight, elasticity : atmospheric pressure due to weight ; barometer ; expansive force of gas, with applications, as air cushion, bicycle tire, football, compressed air motor, air gun, etc. ; relation between the volume and the pressure of a gas. Boyle's law: construction and use of air pump, common pump, force pump, condenser (as bicycle pump) ; buoyant force of gases ; principle of the balloon and airship. Solution, diffusion, occlusion: part played by these processes in nature. Specific gravity ; common methods of finding specific gravities of solids, liquids and gases.

*Second Course.—November to April.*

HEAT : Experiments illustrating the transformation of other forms of energy into heat ; experiments to illustrate the expansion of solids, liquids and gases by heat ; necessity for taking into account the effect of the changes in the temperature in mechanical and industrial work ; methods of measuring the change of temperature, with description of Centigrade and Fahrenheit thermometers ; change of state, phenomena of fusion, ebullition, evaporation liquefaction and solidification ; latent heat ; specific heat ; methods of transference of heat ; conduction, practical methods of heat insulation, principle of Davy's safety lamp, convection currents ; methods of heating and ventilating houses.

ELECTRICITY : Lode-stone, magnetic attraction : magnetization and demagnetization ; polarity ; magnetic induction ; earth's inductive influence ; construction and practical use of the mariner's compass and dipping needle ; geographical and magnetic poles. Construction of simple voltaic cells ; chemical effects of the electric current, decomposition of water by electricity ; magnetizing effects



of the electric current, the construction of an electro-magnet with some of its more common practical applications, as electric bell, telegraph and telephone; heating and lighting effects of the current, arc and incandescent lamps.

**SOUND :** Origin and propagation of sound ; principles of construction of some of the more common musical instruments, as piano, violin, harp, horn and organ ; reflection of sound, echoes ; musical tones ; pitch and quality.

**LIGHT :** Propagation of light, simple experiments illustrating the reflection and refraction of light, the use of mirrors and lenses ; the dispersion of light, color.

**CHEMISTRY —Oxygen :** Preparation, properties, oxidation, examples ; phenomena of combustion ; reduction, examples ; dependence of organic world on oxygen. **Water :** decomposition by electricity, common impurities, tests. **Hydrogen :** preparation and properties. **Ammonia :** preparation, properties, economic uses. **Carbon :** forms, occurrence, properties and uses ; carbon dioxide, preparation by combustion in air ; occurrence in the atmosphere ; preparation from limestone ; properties, comparison with air, relation to plant and animal life, tests ; carbonic acid. **Limestone :** forms, occurrence ; lime and its manufacture ; water on quick lime, result in chemical action ; action of acids on limestone ; other carbonates ; mortar ; building stone, animal shells ; uses of limestone and its products. **Air :** separation of oxygen from nitrogen : properties of the latter. **Acids, bases, salts,** distinguishing characteristics.

**NOTE.**—In physics and chemistry of the Fifth Form no class text books shall be used. The course is to be experimental, with practice by the pupils in the preparation of simple apparatus. Pupils should be encouraged to work at home in these subjects.

## HIGH SCHOOL COURSES OF STUDY.

1. The courses of study in the High Schools shall be taken up in three main divisions : The Lower School (a two or three years' course), the Middle School (a one or two year's course), and the Upper School (a two years' course). The Principal shall make such organization of forms as he may deem expedient.

**NOTE.**—Speaking generally, the Lower School corresponds to the present Forms I. and II.; the Middle School to Form III., and the Upper School to Form IV.

2. (1) The High School courses of study shall be organized as follows :

(a) The General Course ; (b) The Commercial Course ; (c) The Manual Training Course for Boys ; (d) The Household Science Course for Girls ; (e) The Art Course ; (f) The Agricultural Course ; (g) The Courses for University Matriculation and the Preliminary Examinations of the Learned Professions ; (h) The Courses for Teachers' non-Professional Certificates.

**NOTE.**—The programme of studies has been prepared for the general student in particular ; but it includes the work prescribed for University pass and honor matriculation, for the Teachers' non-professional examinations, and for the Preliminary examinations of the learned professions.

(2) The Board of Trustees shall select the courses on the report of the Principal ; but a course shall not be taken up if, on the report of the High School Inspector, the Minister of Education decides that the staff, the equipment, or the accommodations are inadequate therefor.

3. (1) The following shall be obligatory on all pupils : The Lower School courses in geography, arithmetic and mensuration, English grammar, penmanship, and reading ; with English composition, English literature, history, and physical culture, throughout their period of attendance.

(2) Pupils in the general course shall take in addition the art subjects and elementary science, with such other subjects as may be agreed upon between the pupil's parent or guardian and the Principal of the school.

(3) Pupils in the commercial course, the manual training course, the household science course, the art course, and the agricultural course shall take the same obligatory subjects as pupils in the general course, in addition to the special subjects of their course, with such suitable modifications of the obligatory subjects as the Principal may deem expedient.



NOTE.—(1) Where a pupil in any of the courses is likely to remain at school for two years, he should take algebra and geometry in addition; and if for three or more, one or more of the languages.

NOTE.—(2) Under the reconstructed programme a change in the relative amount of time given the different subjects will be necessary; not all subjects should be begun or studied intensively at first; and, by reducing the amount of time for class work, provision should be made for independent work by the pupils at their seats.

(4) In any locality where there is only one high school building, but where the staff and the accommodations are adequate, separate classes may be provided, either wholly or partly, for the obligatory subjects in each of the commercial, the manual training and the agricultural courses, with such suitable modifications of the obligatory subjects as the Principal may deem expedient.

(5) In any locality where there are more than one high school building, the board may make such a differentiation of the courses taken up in each as it may deem expedient.

(5) One of the courses in Reg. 2 (1) above, and not more without the consent of the Principal, shall be taken by each pupil; but the Principal may omit or curtail the course in any of the obligatory subjects in the case of individual pupils who are not preparing for examinations, and whose circumstances, in his judgment, deserve special consideration.

4. (1) Subjects begun in one school division and continued in the higher may be reviewed therein as the principal may deem expedient.

(2) No subject prescribed for the Lower School alone shall be continued into the Middle or Upper School, but after March (and not before) the Principal may provide in the Middle School for the review of the courses in Arithmetic and Mensuration and English Grammar prescribed for University junior matriculation and the preliminary examinations of the learned professions, and in the geography prescribed for the junior non-professional examination for teachers.

5. The following shall be the average minimum amount of time to be devoted each week to each of the following subjects, separately from the other subjects, in the courses where such subjects are obligatory; the average number of pupils in each class being not more than twenty-five and the time being proportionately increased or diminished when the average in the class is greater or less than twenty-five:

(1) *Penmanship*.—Two lessons of 30 minutes from the beginning of the first term in the Lower School for as long as the Principal may deem it expedient.

(2) *Art Subjects*.—Two lessons of 30 minutes each.

(3) *Reading*.—Two lessons of 30 minutes each throughout the Lower School course. In all the school sub-divisions, reading shall also be taken up in connection with English literature.

(4) *Book-Keeping*.—Two lessons of 30 minutes each, begun after the completion of the course in penmanship, or taken in addition thereto, as the Principal may deem expedient.

(5) *Elementary Science*.—A lesson of 30 minutes every day, throughout each academic year of the Lower School course. One of the periods of Elementary Science during the winter months may be given to the review and continuation of the work in Biology.

(6) On the Inspector's report that any of the provisions of sections 1 to 5 inclusive of this regulation have not been observed, the Minister of Education may refuse to accept the Principal's certificate in regard to the subjects of Pt. I of the junior non-professional examination for teachers. See Reg. 6 (2 and 9 (1).

NOTE.—(1) The regulation prescribing a minimum amount of time for penmanship, drawing, reading, book-keeping and elementary science, applies also to Public School Continuation or Fifth book classes in which candidates are prepared for the whole or part of the non-professional examination for teachers.

NOTE.—(2) No departmental examination is held in these subjects and it is necessary to secure as far as practicable a minimum apportionment of time for each subject in at least all schools which take up the work for teachers' non-professional certificates.



6. (1) The course in drill, calisthenics, and gymnastics is obligatory in Collegiate Institutes, and shall be taken up in lessons of 30 minutes each, three times a week, in each form of the Lower School.

(2) Provision for Physical Culture should be made in the Middle and Upper Schools also, but the amount and the character of the provision are left to the discretion of the Principal.

(3) No pupil shall be exempted from the course in Physical Culture except upon a medical certificate or on account of evident physical disability.

(4) During the months of May, June, September, October, and November, the Principal may substitute for drill, etc., such sports and games as he may approve of.

(5) In High Schools having no gymnasium, drill and calisthenics shall be taken up as often as the weather, the accommodations, and the adequacy of the staff will permit; and gymnastics may be omitted.

7. No pupil once enrolled in a Secondary School (a High School, or a Public School Continuation or Fifth Book Class) shall be admitted to another Secondary School unless he presents a letter of honorable dismissal from the Principal of the Secondary School he last attended. In the event of a dispute, the parties thereto shall submit full particulars of the question for final settlement to the inspector or inspectors of the school into which the pupil seeks admission.

## HIGH SCHOOL PROGRAMME.

### LOWER SCHOOL.

PHYSICAL CULTURE—Drill, gymnastics, and calisthenics.

READING.—Practice in oral reading, with exercises for cultivating clear, correct, and expressive utterance in speaking, reading, and recitation. The principles to be learned incidentally. The reading should be both intelligent and intelligible.

ENGLISH GRAMMAR.—The principles of etymology and syntax, including the logical structure of the sentence and the inflection and classification of words. The elementary analysis of words, with the most important Latin and Greek root-words. An elementary knowledge of the formation of the sounds of the language, with their representation by means of the alphabet. An outline of the history of the development of the language.

NOTE.—The use of English Grammar in teaching correct oral and written composition, though important especially when the principles of good English can be intelligently applied, is secondary to the insight it gives into the structure of our thinking and expression. The intensive study of the subject should be reserved for the last year of the course.

ENGLISH COMPOSITION.—Oral and written compositions, chiefly narrative and descriptive. Letter writing. Oral and written reproductions or abstracts of lectures and historical and geographical and other supplementary reading. Application of the principles of good English to the correction of mistakes made by the pupils in speaking and writing. The main principles of composition (rhetoric) should be learned incidentally from the criticism of the compositions, and systematized as the work proceeds.

ENGLISH LITERATURE.—Intelligent comprehension of suitable authors, both prose and poetry. The class work should be supplemented by other suitable authors, provided by the pupils themselves, and supplied from the school and the public library. Memorization and recitation of choice selections in prose and poetry.

NOTE.—The object of the course in the Lower School should be the cultivation of a taste for good literature, not by minute critical study, but by reading at home and in school, aloud and silently, with due attention to the meaning, standard authors whose words will quicken the imagination and present a strong element of interest. Such authors should be chiefly narrative, descriptive, and dramatic.



**HISTORY.**—The leading events of the history of Canada, followed by an outline of British history. Supplementary reading and interesting biographical sketches of persons famous in Canadian and British history. The elements of civil government and the duties of citizenship. Both written and oral reproductions or abstracts in connection with composition.

**NOTE.**—The main purpose of the course at this stage is to train the pupils to grasp the leading events in their logical order, and to arouse an interest in historical reading. As soon as practicable a beginning should be made in appreciating the logical connection of events. Pupils should be trained to use the libraries for reference purposes and for supplementary reading.

**ARITHMETIC AND MENSURATION.**—*Arithmetic*—Review of principles, measures, multiples, fractions (vulgar and decimal). Square root, percentage, interest, discount, commission, stocks, insurance, exchange. Mental arithmetic. The metric system.

*Mensuration.*—The rectangle, the triangle, the parallelogram, the circle, the parallelepiped, the cylinder.

**NOTE.**—The processes and problems in the commercial work should be such as find *direct* application in ordinary business life. Rapidity and accuracy of work should be aimed at. Proofs of the more difficult formulæ in mensuration are not required.

**ALGEBRA.**—Elementary work, factoring, highest common factor and lowest common multiple, fractions; simple equations of one, two and three unknown quantities; square root.

**GEOMETRY.** Definitions, basic geometric conceptions and principles; use of simple instruments, as compasses, protractor, graded rule, etc., measurement of lines and angles, and construction of lines and angles of given numerical magnitude; accurate construction of figures; some leading propositions in Euclidean plane geometry, reached by induction as a result of the accurate construction of figures; deduction also employed as principles are reached and assured. The course in Euclid begun.

**NOTE.**—The introductory course should emphasize physical accuracy as well as accuracy of thought, exactness in drawing lines of required length, in measuring lines that are drawn, in constructing angles of given magnitude, and in measuring angles that have been constructed. The course in Euclid retains his common notions, regarding them from more modern standpoints.

**LATIN AND GREEK.**—The elementary Latin book, including introductory work in the prose authors. The Greek book begun in the second year.

**NOTE.**—Throughout the courses in Latin and Greek, the main objects should be accuracy of knowledge of forms and syntax, accuracy of translation into idiomatic English, and the ability to translate at sight. Attention should also be given to pronunciation and reading aloud.

**FRENCH AND GERMAN.**—Work in French at first wholly without a text book, for the training of the ear and tongue; grammar learned incidentally. Names of common objects, states and actions. Reading of anecdotes, short stories and easy descriptions with oral drill on the material read. After three or four months, the systematic study of the elementary book should be begun, the work being still chiefly oral. Memorization of suitable selections. German begun in the same way the second year, but with a greater apportionment of time and more rapid progress. Where desired, German may be begun first, being followed by French.

**ART SUBJECTS.**—*First Course.*—Drawing from models in light and shade and in color. Memory drawing in both outline and shade. Simple principles of free-hand perspective.

**NOTE.**—When necessary, the object drawing, designing and elementary projection of the public school course should be reviewed.

*Second Course.*—The first course continued. Inventive illustrative drawing. Ornamental design, using outline and color, and introducing practical geometry and its application to design.

**GEOGRAPHY.**—Soil, stones, rocks, strata and their origin; nebular theory; stratified, unstratified, metamorphic rocks; elevation and depression of the crust of the earth, forming continents and oceans; periods in the earth's history in full relation to Canada and to Ontario in particular; life on the earth, fossils. Forms and distribution of land masses, causes, theories regarding them; changes in



land forms ; agents of change, volcanoes, water, etc. Study of the common rocks, minerals and soils of the districts. Mountains, origin, growth, distribution, relation to mines, forests, and climate ; volcanoes and volcanic phenomena ; plains and plateaus—Canada generally, Ontario and the Northwest in particular ; relation of Canadian upheavals, subsidences, glaciation, moraines, gravel ridges, boulders and formations, to the continental areas of which they form a part.

Rivers and river valleys ; lakes ; coast features ; industrial importance of streams, rivers, lakes ; origin and growth of rivers, falls and rapids ; changes in courses with causes ; old river courses, depression and elevation ; erosion by rivers, transportation and deposition of sediment.

The ocean : origin, distribution, depth, movements, currents, tides, waves, ocean bed, etc.

The atmosphere, composition, importance to life, aqueous vapor ; heating of the earth ; depth of the atmosphere ; high and low pressure, the barometer, isobars, etc. ; movements of the air ; winds, their causes, trade-winds, anti-trade-winds, periodic, variable, cyclones, anti-cyclones, thunder storms, tornadoes ; clouds, rain, snow, dew, evaporation ; climate, causes affecting it ; former climatic conditions.

Life : varieties, dependence upon climate, soil, etc. Plant life ; typical forms in different zones, distribution ; marine plants. Animal life ; typical forms, terrestrial, aerial, marine ; direct or ultimate dependence on plant life ; distribution of forms. Man : varieties, distribution, relation to investigation and other animal life and to natural and physical conditions.

The earth as a planet ; the planets ; the fixed stars ; the celestial sphere ; observations of some of the more prominent constellations ; the solar system and its members ; the earth, its size and shape, proofs of shape ; circles on surface ; latitude and longitude ; zones ; daily rotation on axis ; proofs ; day and night ; yearly revolution ; its orbit an ellipse ; perihelion ; aphelion ; seasons ; variation in length of day and night ; measurement of time ; unit of time ; sun-dial ; civil year ; standard railway time of Canada and the United States ; location of position by latitude and longitude ; calculation of times and distances.

The moon : rotations ; phases ; different kinds of months ; various eclipses of the sun and moon ; umbra ; penumbra ; appearance through a telescope ; absence of atmosphere, clouds, etc.

The sun : sun spots, solar heat, radiation, etc. Comets, meteors, nebulae, etc. ; their probable nature, number, revolutions, etc. ; darkness and coldness of space.

Important commercial highways and their relations to centres of population. Natural and manufactured products of the countries of the world, with their exports and imports. Internal commercial highways of Canada and the chief internal commercial highways of the United States. Relation between industrial and commercial centres and physical features ; relation of soil and underlying rock formations to the products of the district, and occupations of the inhabitants. Water ways : their influence on population and settlement, their use as highways of commerce, with special reference to Canadian routes. Typical natural products of different zones. Commercial relations of Great Britain and her colonies, and of Canada and the United States. Forms of government in the countries of the world and their relation to civilization. Relation between the characteristics of a people and their environment.

NOTE.—Excursions, where possible and desirable, especially in connection with the study of rocks, minerals, soils and land formation of the district, and of the work of a stream, river or lake, all of which should be emphasized in due course.

#### ELEMENTARY SCIENCE.

NOTES.—(1). The objects of the course in Elementary Science are to give pupils who will not remain at school more than a couple of years a fair knowledge of the world around them, and to lay a foundation for the more detailed study of each subject in the case of pupils who take the work in the higher forms.

(2). As the course in Elementary Science is a new one, and as there will be no departmental examination on it, full details are given for the guidance of the teacher. The general outline of the course shall be followed, but the extent of the details under each head is left to the principal and the teacher.



*First Course.—September to November.*

BOTANY.—Comparison of higher plants with higher animals ; relation of each to food ; means of obtaining and storing it ; dependence of animals on plants. Relation of plants to light, moisture, and heat, with examples ; water as a solvent, circulation in plants, experiments ; soluble and insoluble material in soils ; importance of each class of material to the plant ; uses of roots and leaves in absorbing food from soil and air, experiments. Struggle for light and moisture, as shown by development of stems, leaves and roots. Uses of hairs, spines, prickles, tendrils, and petioles. The simpler fruits and the means of the dispersion of seeds. Formation of tree buds ; preparation for winter ; annuials, biennials, perennials. The fall of fruits and leaves of deciduous and evergreen trees. The study and interpretation of the marks on trees and shrubs.

*April to June.*

The expanding of buds and the opening of the spring flowers. The functions of flower, bud, leaf, stem, root, etc. ; organs of flowers, their functions ; pollination, fertilization ; germination of the seed, development of the parts, examples—bean, morning-glory, pumpkin, corn. Propagation of offsets, runners, tubers, slips, seeds, grafts, budding. Review of the relations of light, heat and moisture to plants in germination. Objects of pruning trees, transplanting and thinning vegetables. Times of germination and flowering of common plants in their native situations. Conditions governing the growth of the early wild flowers. Modifications in plant growth suitable to environment. Plant societies in different localities. Comparison of spring and autumn flowers. Identification of plants with regular flowers by the aid of the flora.

*Second Course.—September to November.*

BOTANY.—Morphology of the composites,, grasses and sedges. Identification of the simpler ones.

Plant societies continued : peculiarities of each which adapt it to its situation. Special study of weeds, means of controlling them. Morphology and identification of ferns. Parasitism and saprophytism. Study of plant enemies and remedial treatment—the simpler forms ; examination of some common fungi and comparison with some forms of algae. Comparative study of fruits. Special study of leaf, its modifications and adjustments for securing a favorable light position ; its importance in obtaining and elaborating food material ; the part it plays in evaporation.

*April to June.*

Continuation of the study of the local flora. The coniferae : study of the bud ; form, permanence and phyllotaxy of leaves ; flowers ; comparison of twigs and wood with those of other trees. Comparative study of pith and cortical layers. Distinction between endogen and exogen. Meaning, significance, and methods of cross fertilization. Plants in their relation to man ; man's influence on plants. Plant physiology—elementary and experimental ; chlorophyll ; movements on gaseous and liquid nutrients and waste products. Morphology of the catkin and other complex inflorescences. Study of the fungi continued : fungous diseases and their remedial treatment. Relation of plants and plant products to civilization, food, clothing, ornament, medicine ; rubber, tea, spices, etc.

*First Course.—September to November.*

ZOOLOGY.—Relation of insects to flowers. Study of grasshopper, potato beetle, tomato worm, house fly and spider. The life history of at least two insects having complete metamorphoses. Collection of caterpillars infesting common plants for observation of their metamorphoses. Recognition of some of our common birds ; observations on the habits and structure of birds, with a view to their classification as scratchers, swimmers, perchers, etc. ; times of their migrations. Preparation of animals for winter.



*April to June.*

Adaptation of animals for securing food, avoiding enemies, surviving the winter, etc. The life history of the frog. Continuation of the study of the habits of spring birds, especially in regard to their methods of obtaining food and nesting; suitability of feet, bills, color, nests, etc., to their habits of life. Life history and habits of the tent caterpillar and any of the predaceous beetles. Observations upon any conspicuous orchard or garden pests of the season, with their remedial treatment.

*Second Course.—September to November.*

ZOOLOGY.—The mammalia, chief characteristics. Our native Canadian mammals; their adaptation to our climate; their coloration, docility, habits, food, enemies. Modifications for (1) ærial life (bat, flying-squirrel); (2) arboreal life (squirrel); (3) subterranean (wood-chuck); (4) aquatic (beaver, muskrat). Animals that hunt; animals that are hunted; peculiarities of each. Adaptation of the fish, the frog, the bird, the mammal, to their habits of life. Homologies of fins, scales, etc. Comparison of the teeth and integuments of a few typical animals. Winter homes of insects; stages in which insects survive the winter.

*April to June.*

Recognition of birds and insects, continued; their food supply; those beneficial or injurious; bills and feet as a basis of classification of birds. Mouths and wings as a basis of classification of insects. Distinction between biting and sucking-mouthed insects; modes of exterminating them. Determination from examples of the chief characters of each of the large orders of insects. Life-history of any two of carpet-beetle, scale insect, saw-fly, codling moth, mosquito. Rearing these insects to study their metamorphosis. The remedial treatment of insect pests continued. Useful animal products; silk, wool, fur, leather, etc.

NOTE.—Class text books shall not be used. As far as possible, the course shall be a practical one. When desirable, the agricultural applications of the subject should be emphasized. Systematic written description and drawing should be required throughout the course; all these exercises should be dated and preserved for inspection and comparison. Each pupil should possess a good lens, and be taught how to use it. The compound microscope should be used regularly by the teacher for illustrations. Approved methods of collecting and preserving botanical specimens and of keeping live animals suitable for study should be systematically followed. An aquarium and herbarium, and a museum of local biological specimens should be provided where practicable. Much of the practical work, especially the observations, will necessarily be done out of doors by the pupils alone, under the direction of the teacher, or by the pupil, conducted by the teacher.

*First Course.—November to April.*

PHYSICS.—Forms of matter: solids, liquids, gases; different states of the same kind of matter; crystalline and amorphous conditions; theory of constitution of matter. Metric units and standards of length, area, volume, weight, mass, density; experiments in measurements with use of instruments) such as rule, balance, burette, caliper, (simple and micrometer screw). Properties of solids; hardness, malleability, ductility, tenacity, elasticity, plasticity. Properties of bodies which give them value in arts. Properties of liquids; fluidity and viscosity; cohesion and adhesion in liquids; phenomena of capillarity; part played by capillarity in nature; transmission of pressure by liquids; illustrations; construction and uses of hydraulic press. Relation of pressure to depth and density; pressure at a point equal in all directions; the surface of a liquid at rest is horizontal; meaning of the term *level*; construction of the water level and spirit-level; methods of distribution of water supply in cities and towns; buoyancy and floatation. Properties of gases; weight, elasticity; atmospheric pressure due to weight; barometer; expansive force of gas, with applications, as air cushion, bicycle tire, football, compressed air motor, air gun, etc.; relation between the volume and the pressure of a gas. Boyle's law; construction and use of air pump, common pump, force pump, condenser (as bicycle pump); buoyant force of gases; principle of the balloons and airship. Solution, diffusion, occlusion; part played by these processes in nature. Specific gravity; common methods of finding specific gravities of solids, liquids and gases.



*Second Course.—November to April.*

**HEAT.**—Experiments illustrating the transformation of other forms of energy into heat ; experiments to illustrate the expansion of solids, liquids and gases by heat ; necessity for taking into account the effect of the changes in the temperature in mechanical and industrial work ; methods of measuring the change of temperature with description of Centigrade and Fahrenheit thermometers ; change of state, phenomena of fusion, ebullition, evaporation, liquefaction and solidification ; latent heat ; specific heat ; methods of transference of heat ; conduction, practical methods of heat insulation, principle of Davy's safety lamp, convection currents ; methods of heating and ventilating houses.

**ELECTRICITY.**—Lode-stone, magnetic attraction ; magnetization and demagnetization ; polarity ; magnetic induction ; earth's inductive influence ; construction and practical use of the mariner's compass and dipping needle ; geographical and magnetic poles. Construction of simple voltaic cells ; chemical effects of the electric current, decomposition of water by electricity ; magnetizing effects of the electric current, the construction of an electro-magnet with some of its more common practical applications, as electric bell, telegraph and telephone ; heating and lighting effects of the current, arc and incandescent lamps.

**SOUND.**—Origin and propagation of sound ; principles of construction of some of the more common musical instruments, as piano, violin, harp, horn and organ ; reflection of sound, echoes ; musical tones ; pitch and quality.

**LIGHT.**—Propagation of light, simple experiments illustrating the reflection and refraction of light, the use of mirrors and lenses ; the dispersion of light, color.

**CHEMISTRY.**—Oxygen ; Preparation, properties, oxidation, examples ; phenomena of combustion ; reduction, examples ; dependence of organic world on oxygen. Water : decomposition by electricity, common impurities, tests. Hydrogen : preparation and properties. Ammonia : preparation, properties, economic uses. Carbon : forms, occurrence, properties and uses ; carbon dioxide, preparation by combustion in air ; occurrence in the atmosphere ; preparation from limestone ; properties, comparison with air, relation to plant and animal life, tests ; carbonic acid. Limestone : forms, occurrence ; lime and its manufacture ; water on quick lime results in chemical action ; action of acids on limestone ; other carbonates ; mortar ; building stone, animal shells ; uses of limestone and its products. Air : separation of oxygen from nitrogen ; properties of the latter. Acids, bases, salts, distinguishing characteristics.

**NOTE.**—In physics and chemistry of the Lower School no class text books shall be used. The course is to be experimental, with practice by the pupils in the preparation of simple apparatus. Pupils should be encouraged to work at home in these subjects.

**MIDDLE SCHOOL.**

*English Composition.*—Courses in oral and written narration and description continued ; exposition. The study of models of prose writing systematically taken up towards the close of the course.

*English Literature.* The intelligent and appreciative study of authors, both prose and poetry, including those prescribed for pass junior matriculation into the University of Toronto. Supplementary reading provided by the pupils themselves and supplied from the school and the public library. Memorization of choice passages continued.

**NOTE.**—At this stage, the pupils should be able to begin to appreciate literature as such. Besides works of the same character as those taken up in the Lower School, more works of a subjective character may be added. The purpose and spirit of the author and the merits of his thoughts and style should now be moderately dealt with ; his defects should not be emphasized. The chief object is still the cultivation of a taste for good literature, and the authors should be read partly in class and partly at home, both silently and aloud.

**HISTORY.**—*British History.* Great Britain and Canada from 1763 to 1885, with the outlines of the preceding periods of British history ; the geography relating to the history prescribed.



*Ancient History*.—Outline of the history of Greece to the fall of Corinth, and of the history of Rome to the death of Augustus.

NOTE.—The details of the political history are not so important as the causes and consequences of events, and the social life, literature, art, etc., of the peoples. In British (including Canadian) history the development of our political institutions should receive special attention.

ALGEBRA.—The course in the Lower School completed. Indices, surds; quadratics of one or two unknown quantities, the relation between roots and coefficients.

GEOMETRY.—The leading propositions of Euclid, Books I., II. and III. Deductions.

LATIN AND GREEK.—Course in the Lower School continued, with the texts prescribed for pass junior matriculation into the University of Toronto.

(See note under the course of the Lower School).

FRENCH AND GERMAN.—Course in the Lower School continued, with the texts prescribed for pass junior matriculation into the University of Toronto.

CHEMISTRY.—An experimental course defined as follows:—Properties of hydrogen, chlorine, oxygen, sulphur, nitrogen, carbon, and their more important compounds. Nomenclature. Laws of combination of the elements. The atomic and molecular theory. Attention to the economic values of the substances dealt with.

NOTE.—A list of the economic and industrial applications will be given.

PHYSICS.—An experimental course defined as follows:

*Heat*.—Nature and sources of heat; expansion of solids, liquids, and gases through heat; temperature, distinction between heat and temperature, Fahrenheit and Centigrade thermometers, air thermometer, maximum density of water, relation between volume and the temperature of a gas (Charles' Law), absolute temperature; change of state, fusion, solution, and solidification, vaporization and liquefaction, latent heat, specific heat; transmission of heat, conduction, convection, radiation.

*Electricity*.—Voltaic cells, common kinds; chemical action in the cell; magnetic effects of the current; chemical effects of the current; voltameter; astatic and tangent galvanometers; simple notions of potential; Ohm's law, with units; shunts, measurement of resistance; best arrangement of cells: electric light, arc and incandescent; magnetism; inclination and declination of compass; current induction; induction coil; dynamo and motor; the joule and watt; electric bell; telegraph; telephone; electro-plating; elements of terrestrial magnetism.

*Sound*.—Caused by vibrations; illustration of vibrations, pendulums, rods, strings, membranes, manometric flames, plates, columns of air; propagated by waves; its velocity; determination of velocity; pitch; standard forks, acoustical  $C = 512$ , musical,  $A = 870$ ; intervals; harmonic scale; diatonic scale; equally tempered scale; vibration of air in open and closed tubes, with wave-lengths; resonators; nodes and loops; vibrations of strings and wires; reflection of sound.

*Light*.—Rectilinear propagation; image through a pin hole; beam; pencil; photometry; shadow and grease-spot photometers; reflection and scattering of light; laws of reflection; images in plain mirrors; multiple images in inclined mirrors; concave and convex mirrors; drawing images; refraction; laws and index of refraction; total reflection; path through a prism; lenses; drawing image produced by a lens; simple microscope; dispersion and color; spectrum; recomposition of white light.

NOTE.—The course in Heat above is the Lower School course broadened; and part of the courses in Electricity, Sound, and Light has already been taken up in the Lower School.

## UPPER SCHOOL.

ENGLISH COMPOSITION AND RHETORIC.—Middle School course continued; argumentation: course still both oral and written. Critical study of prose models continued. The principles of rhetoric systematically studied.



ENGLISH LITERATURE.—The intelligent and appreciative study of authors, both prose and poetry, including those prescribed for honor junior matriculation into the University of Toronto. Supplementary reading provided by the pupils themselves and from the school and the public library. Memorization continued.

NOTE. At this stage the pupil should be able to read literature still more appreciatively; but the chief object continues to be the cultivation of a taste for good literature, and critical study should be subordinated thereto.

HISTORY.—*British History*: From 1453 to 1763. *Ancient History*: Course in Roman and Grecian History of the Middle School reviewed, with an outline of the art, science, literature, law, philosophy, and social life of the Greeks and the Romans. An outline of the ancient history of the Eastern nations.

*Mediæval and Modern History*.—An outline.

NOTE. For the new work prescribed, a list of texts showing the extent, will be given.

ALGEBRA.—Elementary rules, highest common measure, lowest common multiple, fractions, square root, simple equations of one, two and three unknown quantities, indices, surds, quadratics of one and two unknown quantities, relation between roots and coefficients, theory of divisors, ratio, proportion and variation, progressions, scales of notation, permutations and combinations, binomial theorem, interest forms, annuities and sinking funds.

GEOMETRY.—The course in Euclid, books I–III of the Middle school, reviewed, with the leading propositions of Euclid, books IV and VI, and the definitions of book V. Deductions.

TRIGONOMETRY.—Trigonometrical ratios with their relations to one another; sines, etc., of the sum and difference of angles with deduced formulæ. Use of Logarithms. Solution of triangles. Expressions for the area of triangles. Radii of circumscribed, inscribed, and escribed circles.

LATIN AND GREEK.—Course of the Middle School in grammar and composition continued, with the special study of the authors prescribed for honors at the matriculation into the University of Toronto.

(See note under courses in Lower School).

FRENCH AND GERMAN.—Course of the Middle School in grammar and composition continued, with the special study of the authors prescribed for honors at matriculation into the University of Toronto.

NOTE.—At this stage the pupil should be able to acquire and appreciate the author's thoughts through reading the language without translating it into English. He should also have acquired some facility in conversation.

PHYSICS.—An experimental course defined as follows:—

*Mechanics*.—Measurement of velocity; uniformly accelerated rectilinear motion; metric units of force, work, energy and power; equilibrium of forces acting at a point; triangle, parallelogram, and polygon of forces; parallel forces; principle of moments; centre of gravity; laws of friction; numerical examples.

*Hydrostatics*.—Fluid pressure at a point; pressure on a horizontal plane; pressure on an inclined plane; resultant vertical pressure, and resultant horizontal pressure, when fluid is under air pressure and when not; transmission of pressure; Bramah's press; equilibrium of liquids of unequal density in a bent tube; the barometer; air pump; water pump, common and force; siphon.

CHEMISTRY AND MINERALOGY.—An experimental course defined as follows:—

*Chemistry*.—Chemical theory. The practical study of the following elements, with their most characteristic compounds, having regard to Mendelejeff's classification of the elements, and some of the most important economic and industrial applications. Hydrogen; Sodium; Potassium; Magnesium, Zinc; Calcium; Strontium; Barium; Boron, Aluminum; Carbon, Silicon, Tin, Lead; Nitrogen; Phosphorus; Arsenic; Antimony, Bismuth; Oxygen, Sulphur; Fluorine, Chlorine, Bromine, Iodine; Manganese, Iron. Elementary Qualitative Analysis of a simple salt, consisting of one acid and one base.

NOTE.—A list of the economic and industrial applications will be given.

*Mineralogy*.—The Lower School course in Geology (under Geography) reviewed and broadened. General chemical composition of the earth's crust. Meaning of



term mineral; crystalline state of matter ; physical character of minerals, hardness, streak, lustre, specific gravity, studied from actual specimens. Meaning of terms rock, ore. The rock-forming minerals, Calcite, Quartz, Orthoclase, Plagioclase, Muscovite, Biotite, Hornblende, Pyroxene, Olivine ; studied from hand specimens. Examination of hand specimens of the following rocks:—Igneous—Granite, Syenite, Diorite, Gabbro, Trachyte, Andesite, Basalt Aqueous—Conglomerate, Shale, Limestone. Metamorphic—Marble, Gneiss, Slate, Schists. Veins—Kinds, how formed, how filled.

Determination with the aid of simple mineral tables of the following :—Magnetite, Hematite, Pyrite, Galena, Gypsum, Halite, Graphite, Mispickel, Pyrolusite, Stibnite, Zincblende, Chalcopyrite. Occurrence of gold, silver, coal. Chief deposits of economic minerals in Canada.

NOTES.—(1) All the minerals and rocks named in the above course can be obtained either from the Geological survey at Ottawa or by purchase from dealers in chemical or mineralogical supplies. Many, if not most of them, can also be found by a careful examination of any well developed gravel pit, a stone pile, or from the glacial boulders scattered widely over Ontario. Pupils should be required to make excursions in the neighborhood of the school for the purpose of obtaining them and observing the geological formations.

(2) The only apparatus required will be a blowpipe, file, a small magnet, a short piece of platinum wire, and a good hand lens. Borax and microcosmic salt will be found in the chemical laboratory.

(3) The work in mineralogy can be covered in not more than twenty-five lessons. The work in Physics has been reduced.

**BIOLOGY.**—A practical course defined as follows :

*Zoology.*—Thorough examination of the external form, the gills and the viscera of some common fish. Study of the prepared skeleton of the same. Demonstration of the arrangement of the muscular and nervous systems and sense organs, as far as these can be studied without the aid of a microscope. Comparison of the structure of the frog with that of the fish. The skeleton of the pectoral and pelvic girdles, and of the appendages of the frog, and the observation of the chief facts in the development of its spawn, till the adult form is attained. Examination of the external form of a turtle and a snake Examination of the structure of a pigeon or a fowl. Study of the skeleton and also of the teeth and viscera of a cat or dog. Study of the cray-fish as a type of the Arthropods. Comparison of the cray-fish with an insect (grasshopper, cricket or cockroach), also with a millipede and a spider. Examination of an earthworm and a leech. Study of a fresh water mussel and a pond snail. The principles of zoological nomenclature illustrated by some of the common fresh water fish, such as the sucker and herring, bass and perch. Study of an amoeba paramoecium as a type of a unicellular animal. The modifications of the form of the body in vertebrates in connection with different methods of locomotion. The natural habits of the various animals examined. A collection of economic insects with specimens of injuries and a further study of their remedial treatment. Comparison of the types taken up in the high school course with a general view of classification.

*Botany.*—The practical study of representatives of the flowering plants of the locality in which the school is situated, and representatives of the chief sub-divisions of cryptogams, such as a fern, a lycopod, a horsetail, a liver-wort, a moss, a lichen, a mushroom and a chara, with a general view of classification. An elementary knowledge of the microscopic structure of the bean and the maize. Drawings and descriptions of parts of plants, and classification. Comparison of different organs, morphology of root, stem, leaves, hair, parts of the flower, reproduction of flowering plants, pollination, fertilization and the nature of fruits and seeds. Laboratory course in plant physiology, with studies of protoplasm, osmosis, absorption of food material ; culture fluids, transpiration, digestion, respiration, growth and movement. Common economic fungi (a collection to be made) with further study of fungous diseases.

NOTE—A certificate signed by the principal and the teacher or teachers of science, and endorsed by the high school inspector, that the candidates at the senior non-professional examination for teachers have taken up practically the several courses in science for the upper school, will be accepted by the examiners in lieu of the practical examination held heretofore.



## SPECIAL LOWER SCHOOL COURSES.

NOTE. In regard to these courses, see Reg. 2 (2) preceding. They are to be taken up only when the staff, the equipment and the accommodations are adequate.

### I. COMMERCIAL SUBJECTS.

#### *First Course.*

BOOK-KEEPING.—Single entry and double entry. Use of journal day book, cash book, bill book and ledger, the first two as books of original entry, and cash book with special columns for merchandise on the debtor side and for expense on the creditor side ; transactions, including discounts and renewals of notes and drafts, trade discounts, deposits in banks and the use of checks ; changing from single entry to double entry, and from double entry to single entry ; sets in simple partnership ; statements of assets and liabilities and of profit and loss.

BUSINESS FORMS.—Receipts, promissory notes, chattel notes, drafts, bills of exchange, orders, due bills, deposit slips, checks, bank drafts, bills, invoices, credit invoices, accounts, monthly statements, financial statements, indorsement and acceptance and consequent liability.

PENMANSHIP.—Correct position and movement ; principles of letter formation ; graceful, legible business hand ; ledger headings ; figures ; letter writing ; addressing envelopes and parcels.

STENOGRAPHY.—The theory. Dictation and transcription.

#### *Second Course.*

BOOK-KEEPING.—Single entry and double entry, and changing from one system to the other. Use of journal day book, invoice book, sales book, cash book, bill book and ledger, the first five as books of original entry ; use of journal and cash book with various special columns ; manufacturing, using time sheet and pay roll ; commission business, shipments, consignments ; banking, including deposits, withdrawals, discounts, collections ; partnership and the sharing of profits and losses by various methods ; practical treatment of freight, duties, discount, bank and bad debts accounts ; division of merchandise and expense accounts into various departments. Financial statements : assets and liabilities, profit and loss, trading account, income and expenditure, receipts and disbursements, comparative statements.

BUSINESS FORMS AND BUSINESS LAWS.—Forms of the first year, together with deposit receipts, warehouse receipts, lien notes, shipping bills, bills of lading, proxies, power of attorneys, time sheets, pay rolls, bank pass books, account sales.

Negotiable paper ; discharge, dishonor and protest ; negotiability and assignability ; accommodation paper ; statute of limitations ; statute of frauds ; money ; interest ; banking organization, business, note issue ; partnership ; crossed checks ; collections of accounts ; balance of trade, meaning and effect on exchange ; liability as partners and shareholders ; contracts—kinds, legality, parties, consideration ; insurance, kinds of policies, duties of the insured ; chattel mortgages and mortgages on real estate, definition, registration, limitation, assignment, discharge ; searching the title of lands.

PENMANSHIP.—Course of first year continued ; acquisition of speed ; marking boxes, barrels, etc.

STENOGRAPHY.—Course of the first year continued. Speed of 60, 80 and 100 words per minute, transcription at the rate of 15 words per minute should be attained.



**TYPEWRITING.**—Copying documents, transcription of shorthand notes, tabular work, manifolded, letter press copying. Touch system recommended.

**NOTES (1).**—The two courses in the commercial subjects, outlined above, are intended to cover two years' work, with a minimum of a general education. If a good course is taken in English, mathematics, and science, with one or more of the languages added, the work should extend over three years.

**NOTE (2).**—Pupils whose period of attendance is to be less than two years, may, with the Principal's consent, take up the course in typewriting during the first year. The principal may also make such modifications of the whole commercial course as will meet the special needs of the locality.

## II. AGRICULTURAL SUBJECTS.

**REQUIREMENTS :** 1, *Experimental plots*; 2, *school garden*; 3, *arboretum*; 4, *science laboratory*.

**A. THE SOIL :** Kinds of soil. Heavy and light soils ; characters. Warm and cold soils ; characters and causes. Sandy, clay, loamy and humus soils ; characters. Glacial, alluvial, marsh and residual soils ; characters.

Soil water. Uses of water in the soil. Water capacity of soils ; experiments. Capillarity ; importance of. Percolation of rain water ; experiments. Conservation of soil moisture ; importance of methods. Drainage ; objects ; injurious effects of stagnant water.

Food materials in the soil ; how roots absorb ; osmosis ; selection of food materials. Bacteria in soil ; nitrifying and denitrifying. Rotation of crops ; necessity for ; food requirements of each crop.

Relation of air to soil.—Need of air to roots, Drainage ; best methods.

Tillage.—Objects of. Methods of.

Fertilizers.—Use of ; when to be applied. Kinds.

**B. THE PLANT :** How plants feed ; air and soil food materials. How plants grow and are reproduced ; grafting, budding, etc. Crops of the farm, orchard and garden ; care of ; value of leguminous crops. Rotation of crops ; necessity for ; systems ; weeds and their eradication ; weed seeds, dispersion and propagation ; enemies (insect and fungi) ; methods of control ; spraying ; time and conditions for seeding and planting ; studies of germination ; selection of seed ; clean seed ; methods of testing seeds ; forestry on the farm ; silos and silage ; fodders in general, grasses and clovers ; farm surroundings and ornamentation ; country roads, etc.

**C. THE ANIMAL :** Resemblances and differences between plants and animals ; physiology of animals ; feeding and digestion ; rations ; breeds,—excursions to farms ; care of animals ; ventilation of stables, etc. ; bacterial diseases.

## III. MANUAL TRAINING SUBJECTS.


**First Course :—**1. Wedge, bass or white wood. 2. Rectangular ruler, white pine. 3. Sawing exercise, white pine. 4. Rect. Flower stick, white pine or bass wood. 5. File handle, bass or white pine. 6. Round ruler, mahogany or bass. 7. Marble board, white pine. 8. Key rack, basswood or white pine. 9. Tip cat, soft maple. 10. Tooth-brush rack, white pine or bass. 11. Pencil sharpener, pine. 12. Plant label, pine. 13. Sand paper block, bass. 14. Hexagonal tea-pot stand, bass or whitewood. 15. Door button on base, white pine. 16. Finger plate, soft maple. 17. Desk tray, satin, walnut or red cedar. 18. Cube, pine. 19. Tip cat bat, soft maple. 20. Flower pot cross, pine.


**Second Course :—**1. Mortise and bridle exercise, pine. 2. Fish line winder, soft maple or butternut. 3. Bridle joint, white pine. 4. Tent peg, soft maple. 5. Bench hook, red oak. 6. Sugar paddle, soft maple. 7. Bracket, whitewood. 8. Hammer shaft, ash. 9. Battledore, whitewood and black walnut. 10. Pen tray, birch or black walnut. 11. Tea-pot stand, whitewood. 12. Nailed box, pine. 13. Spade bale, red oak or ash. 14. Gate hook, oak, soft maple, or birch. 15. Whistle, soft maple or cherry. 16. Letter file, oak, soft maple or birch. 17. Clothes peg, birch or ash. 18. Soap box, white pine. 19. Paper knife, soft maple or birch. 20. Egg stand, birch or cherry.



*Third Course* :—1. Pin bowl, soft maple. 2. Sliding box, bass or whitewood. 3. Whisk holder, soft maple. 4. Hat rack, cherry. 5. Spoon, soft maple or birch. 6. Photograph frame, oak or maple. 7. Foot stool, bass or whitewood. 8. Mallet, beech, hickory or elm. 9. Butter spade, soft maple. 10. Towel roller, whitewood. 11. Sugar spile, soft maple. 12. Inlaid tea-pot stand, bass, whitewood, inlay walnut and white pine. 13. Coat hanger, ash or oak. 14. Book rest, black walnut or oak. 15. Handkerchief box, white wood. 16. Feeding trough, white pine. 17. Inkstand, oak. 18. Oxford frame, bass wood. 19. Try square, beech or soft maple. 20. Weather vane, white pine.

*Fourth Course* :—1. Rebated mortise joint, white pine. 2. Towel roller, whitewood, sheet brass, round brass wire. 3. Scoop, birch or soft maple. 4. Tee and set squares, black walnut. 5. Drawing board, white pine and any hard wood. 6. Three pin dovetail, white pine. 7. Bow or turn saw, beech or soft maple. 8. Stationery case, oak or black walnut. 9. Spokeshave, box, beech or maple. 10. Bracket, birch. 11. Drawer front dovetail, whitewood or white pine. 12. Dovetailed box, white pine. 13. Baseball bat, ash. 14. Small book shelves, pine. 15. panelled frame, whitewood and oak. 16. Knife box, white pine. 17. Blue print frame, elm. 18. Stool, pine. 19. Try square, cherry, birch or beech. 20. Nature study carrying case, oak.

 If the pupil has received one year's training in the Public Schools the second course given should be the basis of his first year's High School work ; if he has had two years' training, the third course ; and so on.

 As will be seen under note (7) below, *the Courses given above are merely suggestive* ; they may be modified to suit conditions.

NOTE (1)—Particular attention should be paid to the preparation of working drawings by the student. These should be either full size or to a fairly large scale. Orthographic projections (plans, elevations and sections) and isometric views should be used and no exercise should be commenced unless a fully dimensioned drawing has previously been made or is being made concurrently with the bench work. Freehand sketching should also be used in making drawings of leaves, tree sections, tools, etc., and in completing curved portions of working drawings. In the more advanced classes the making of blue prints such as are used in general workshop practice may be undertaken with advantage.

(2) The practical work in wood or metal should consist of a series of exercises or models, carefully graded in the order of difficulty of their tool manipulations and should include all processes involved in the production of a finished article from the rough material. In all grades the work may be made a valuable adjunct to the ordinary studies, as for example, in the construction of simple pieces of apparatus to illustrate the pupil's experiments in physics, the making of useful stands, racks, etc., for the chemical laboratory and of models for the illustrations of problems in geometry, algebra and arithmetic.

(2) The tools required in the early stages of woodworking are the knife, the saw, the plane, and the chisel. The construction and mode of use of these tools and the demonstrations illustrating the proper method of sharpening them and of keeping them in good working order should be shown incidentally throughout the course. More advanced pupils should be required themselves to sharpen the edge tools they use.

(4) Clear ideas should be acquired respecting the various kinds of hard and soft woods, the growth and structure of wood, its fibre and grain, and the uses of different varieties of timber ; the felling, seasoning and conversion of timber ; warping, twisting and checking of wood, how caused and how remedied. In advanced classes various methods of finishing, as shellacing, staining, varnishing, etc. The proper use of nails and screws should be explained and practised till a fair measure of accuracy has been attained.

(5) If facilities for working in metals are provided the pupil should begin by chipping a plane surface, then completing it with a file ; filing a cube until the sides are accurately plane and parallel to each other. Making a hexagonal prism and a hexagonal bolt head will be found good exercises for using the file. Making a nut gauge, a square, and various kinds of punches might follow. Drilling a circular hole in an iron plate, screw cutting and similar exercises will enable the pupil to take part in the construction of some useful tool for the room. Instruction may subsequently be given in the methods of joining metal work by welding, riveting, etc. The use of cold riveting may be shown even when there is no smith's hearth. A similar series of exercises might be introduced for brass in the place of iron. Where facilities exist, a course should be given involving the use of the lathe for metal work and a blacksmith's forge will be found extremely useful.

(6) Either system of measurement—English or metric—may be used ; but, as in all scientific work the metric system is coming into general use, it is advisable, in the higher classes at any rate, at least to combine the systems.



(7) Although the course in manual training has an æsthetic and an utilitarian value, its main object is disciplinary. As the requirements of different localities may vary, boards are accordingly at liberty with the preceding limitations, to formulate their own courses. The preceding courses are graduated in the order of the difficulty of their tool manipulation and may be taken as a basis on which to draw up a scheme suitable for any particular locality. The first ten models of each course are sufficient for the work of one year, together with lessons on tools and timber. The second scheme of ten is given with the idea of offering some choice to both teacher and pupil. Within the limits of his capacity a boy might be allowed to choose his own work, and should be encouraged to suggest modifications in size and design of the type-model presented by the teacher. Once, at least, in each year the student should be required to design and execute an original model, and every opportunity should be given for independent work. In substituting models which may be more applicable to the locality, only those should be chosen which contain practically the same tool operations.

#### IV. HOUSEHOLD SCIENCE SUBJECTS.

##### COOKERY AND SANITATION.

###### *First Course.*

I. THE KITCHEN.—Function, furnishing and care of ; selection, care and use of utensils, towels ; coal and gas ranges, construction, use and care ; combustion ; fuels, value and economical use.

II. THE HUMAN BODY. —A machine for doing work ; nutrition, growth, waste, repair ; composition of body and of foods compared.

III. FOODS—Function, necessity for variety, effects of cooking ; classification of food principles.

(1) Incombustibles—(a) Water ; sources, use in body and house. (b) Mineral matter ; source, use in body.

(2) Combustibles—(a) Heat givers (carbonaceous) : (1) Carbohydrates ; starch, sugar ; (2) Fats and oils. (b) Heat givers and flesh formers (nitrogenous) : (1) Proteids ; flesh foods, meat, fish, eggs, casein of milk and cheese, gluten of cereals, legumen of peas and beans.

(3) Cooking :—Principles involved in different methods employed and application of various methods to foods of different character ; principles involved in making the staple food dishes.

##### IV. PERSONAL HYGIENE.

V. LABORATORY WORK. — Care of kitchen and equipment, sink, stove ; sweeping and dusting ; use and care of refrigerator, pantry, cellar, water supply ; economical preparation and serving of beverages, vegetables, cereals, fresh and dried fruits, soups, eggs, meat, tender and tough, bread, baking powder and soda biscuit, simple salads and deserts, particular attention being given to cheap foods, cuts of meat and “left overs ;” individual serving, setting of table ; hospitality and courtesy ; marketing.

###### *Second Course.*

I. REVIEW AND ELABORATION OF PRINCIPLES TAUGHT IN FIRST YEAR.

II. DIETETICS (elementary).—Complementary foods ; diet for school children and for varying conditions of temperature and occupation ; arranging simple attractive menus to contain food elements properly balanced for day's ration ; cookery for invalids ; infant feeding.

III. HYGIENE OF THE HOME.—Ideal location of house ; sanitary surroundings ; ventilation and value of fresh air and sunshine ; virtue of cleanliness ; chemistry of cleaning ; care of bed and bath-room ; household pests.

IV. FURNISHING —Treatment of different rooms, use of hangings, pictures, plants, selection of furniture

V. PUBLIC HYGIENE.—Children's work in public hygiene

VI. LAUNDRY WORK.—Fundamental principles of laundry work.

VII. HOME NURSING AND EMERGENCIES (elementary).—Furnishing of a sick room, making of bed. Changing bed linen and care of patient. Administration of food and medicine. Treatment of faint, burn, frost bite, cut finger and splinter in finger. Simple bandaging.



## VIII. FERMENTATION, YEASTS, MOLDS, BACTERIA (elementary).

IX. LABORATORY WORK.—General cookery, more advanced than first year. Preparing and serving breakfast and luncheon. Preparing simple dishes for invalids and setting invalid's tray. Care of infant's milk bottles. Making small bed. Care of linen, china, silver, brass, nickel, marble, hard wood. Washing and ironing napkins, doylies, tea towels. Care of lamp. Demonstration of making invalid's bed and simple bandaging.

## NEEDLEWORK.

*First Course.*

I. PLAIN SEWING —All kinds of hand sewing, including buttonholes, patching and darning. Talks on implements used. Study of fabrics. Growth of cotton and flax. Cultivation of silk worm and processes of manufacture. Demonstration of primitive methods of weaving. Basting and running stitches, back stitch, half-back stitch, combination stitch, overcasting, overhanding on folded and selvedge edges, true bias, matching stripes, plain hemming, French hemming, joining bias strips, straightway fell on flannel, herring bone stitch, gussets, gathers and stitched band, hemmed band, chain and feather stitch, hem stitch, loop stitch, blind loops, buttonhole stitch, sewing on buttons, tapes, hemmed patch, overhand patch, flannel patch, slip stitch, stockinet darning, cashmere darning, mending from home and application of these stitches in making button bags, shoe bags, shoe holders, hemming towels, aprons, dressing doll.

II. BASKET AND RAFFIA WORK.—Source, kinds and use of wicker and raffia. Making of table mats, napkin rings, doll's hats, work baskets, porch mats, furniture beaters, etc.

*Second Course.*

I. TAKING MEASUREMENTS, ETC.—Talks on materials suitable for underwear. Embroideries, laces and other trimmings. Instruction in the use of patterns. Cutting, fitting and making corset cover with French fell. Taking measurements and drafting pattern for drawers. Cutting out drawers. Making tucks and preparing the trimming. Putting tucks and insertion together. Gathering, stroking and putting on ruffles. Making French seams and placing placket gusset. Putting on yoke or band. Making button holes. Drafting pattern for skirt. Taking measurements, cutting, fitting and making night gown.

II. SEWING MACHINE.—Threading, running, oiling, cleaning. Use of attachments.

III. SIMPLE EMBROIDERY.—Application of sewing stitches in outlining, and Kensington stitch on doily or tray cover. Embroidering initials. Hemstitching. Fringing doily.

NOTE—The courses in Household Science are of two years; but, when the conditions render it desirable, they may be extended over a longer period.

## SPECIAL MIDDLE SCHOOL COURSES.

NOTE.—In regard to these courses, see Reg. 2, (2) preceding. They are to be taken up only when the staff, the equipment, and the accommodations are adequate.

## I. ARITHMETIC AND ENGLISH GRAMMAR.

## JUNIOR NON-PROFESSIONAL EXAMINATION FOR TEACHERS.

ARITHMETIC.—More extended study of the theory. Continuation of the work in commercial arithmetic, with annuities and equation of payments. Review of work in mensuration, with the pyramid, the cone, and the sphere; the derivation of the formulae. Logarithmic computation.



ENGLISH GRAMMAR.—More extended study of the course in the Lower School.

NOTE.—As stated in Reg. 4 (2) the geography for the junior non-professional examination, for teachers, and (if the remodelled matriculation course requires it) the English Grammar and the arithmetic and mensuration of the Lower School may be reviewed in the Middle School after March. In constructing his time-table in September, the Principal might consider this in allotting the time to the English literature and the algebra, or other suitable subject, and to one of the other subjects taken by the teacher in geography, so that it would be unnecessary to reconstruct the time-table, part of the time being given to the review subjects.

## II. ART SUBJECTS.

Advanced drawing from flowers, drapery and natural objects, in black and white and water color. Pen and ink drawing for illustrating purposes. Ornamental drawing on blackboard. Out-door sketching from nature in pencil, charcoal and water colors. History of art.

Charcoal drawing and painting ornamental casts and antique statues. Modelling in clay. Ornamental design. Elementary practical geometry as far as necessary for geometric designs. Drawing conventional flowers, leaves, rosettes, etc., based on natural forms. Designs for floor-cloths, wall-paper, wood and iron work. Tinting designs in water colors. The principles of design and anatomy of pattern.

Practical geometry. Projection of points, lines and solids. Parallel and angular perspective.

Machine drawing. Use of instruments. Drawing details, bolts, nuts, screws gear wheels.

Architecture. Elementary architectural design and decoration, plans, elevations, sections. Perspective architectural drawing in pen and ink and water colors. The different styles of architecture.

NOTE.—The art subjects may be continued, if desired, in the Upper School.

## THE SCHEME OF THE DEPARTMENTAL EXAMINATIONS.

1. All departmental Public and High School examinations will be abolished except the High School Entrance examination, the Junior and Senior Non-professional examinations for Teachers, and, in certain counties, the examination for Local (district) certificates.

2. The Teachers' examinations will be wholly separate from the University matriculation examinations, and the papers therefor will be constructed wholly with a view to the requirements of the Public Schools.

3. At all the examinations, a confidential report from the staff, or the teacher as the case may be, as to the standing of their candidates will be taken into account.

Note.—Leaving certificates and commercial diplomas may be awarded by the different high and public schools on such bases as each may determine. The joint University matriculation examinations may be conducted by the Education department, and the learned societies may select the papers—university or departmental—and determine the standard, that will meet the requirements of their preliminary examinations. The results of such examinations will be communicated to such bodies as heretofore by the Education Department.

### HIGH SCHOOL ENTRANCE EXAMINATION.

4. The subjects will be those prescribed for the Fourth Form of the Public Schools, as follows :

PART I.—Literature, History, Art subjects, Physiology and Hygiene, Nature Study.

PART II.—Reading (written and oral), Penmanship, Spelling, Geography, Grammar, Composition, Arithmetic.



(1) The "literature" of Part I. will embrace the careful reading during the previous year of at least four suitable works selected by the Principal from a list of supplementary reading in English literature prepared by the Public School Inspector.

(2) No candidate will be admitted to the examination in the subjects of Part II., who is not reported by the Principal to the Public School Inspector as having completed satisfactorily the courses in the subjects of Part I. This report as well as the confidential report of the teacher or staff (see Reg. 3 above) will be submitted to the Public School Inspector with the candidate's application for admission to the examination on the subjects of Part II.

(3) On the courses in the subjects of Part II, the examinations will be held, as at present, on papers prepared by the Education Department; but, as at present, the settlement of the results will be wholly in the hands of the Entrance Board.

(4) The oral examination in Reading in Part II will determine mainly whether the candidate reads intelligibly; and the written examination, whether he reads intelligently. The examination paper in Reading will, therefore, be based on sight passages and on lessons in the Fourth Book and will be similar in character to the papers now set in "literature." The candidate's knowledge of the selections for memorization will also, as heretofore, be tested on this paper.

(5) At his official visits to each school the Public School Inspector shall satisfy himself as to the efficiency of the provision for carrying out regulation, 4(2) preceding, and he shall submit the Principal's report to the High School Entrance Board for its consideration.

5. (1) When a candidate has not been prepared in a Public or a Separate School, the Public School Inspector shall admit him to the examination for Part II., and shall report the circumstances of the case to the Entrance Board, which will deal with each case as it may deem expedient.

(2) In the interval between examinations, a pupil who has been prepared on a different course in another province or country, or a pupil who was unable to attend the Entrance examination, may be admitted temporarily to a High School by the Principal, with the concurrence of the Public School Inspector, if in their judgment he is able to take up the work of the High School. A report showing the age and attainments of such pupil, with the reasons for his admission, and signed by the Principal and the Public School Inspector, shall be submitted to the Entrance Board at its next meeting. The Board shall then finally dispose of the case, and shall include the entrant's name in its report at the next annual examination.

## TEACHERS' NON-PROFESSIONAL EXAMINATIONS.

### I. JUNIOR NON-PROFESSIONAL EXAMINATION FOR TEACHERS.

6. The subjects of examination will be as follows :—

PART I. *Lower School Courses*,—Book-keeping and Commercial Transactions (first course), Reading, Art subjects, and Elementary Science.

PART II. *Middle School Courses*,—English Composition, English Literature, English Grammar, British and Ancient History, Arithmetic, Algebra, Geometry, Physics, Chemistry, and the Geography of the Lower School.

(1) The Departmental Examinations, on the subjects of Part II, will be held annually in July, by the Education Department, as at present.



(2) No candidate will be admitted to the examination on the subjects of Part II., who has not been reported to the Public School Inspector by the Principal in whose school he took up the work of the Lower School, as having completed satisfactorily the courses for Part I., as prescribed above.

(3) The candidate must also submit a certificate from the Principal of the last school he attended, that he has read carefully during the previous year, at least four suitable works in English literature, in addition to those taken up in class in the Middle School.

(4) At his official visits to each High School, the High School or other Inspector will satisfy himself as to the efficiency of the provision for carrying out this regulation. On his report, the Minister of Education may refuse to accept the certificate of the Principal in regard to the subjects of Part I.

## II. SENIOR NON-PROFESSIONAL EXAMINATION FOR TEACHERS.

7. The subjects of examination will be those prescribed for the Upper School of the High Schools, and the examination may be taken at one time or in two parts at different times, as follows ;—

PART I.—(*To be taken first*) *Upper School Courses*: English Composition and Rhetoric, English Literature; Ancient, Mediæval and Modern History; Algebra, Geometry, Trigonometry.

PART II.—*Upper School Courses*: British History, Physics, Chemistry and Mineralogy, Biology, with the Latin of the Middle School.

(1.) Before being admitted to the examination in both parts, or in either part, the candidate must submit to the Public School Inspector a certificate from the Principal of the last school he attended that he has read carefully during the previous year at least four suitable works in English literature, in addition to those taken up in class in the Upper School.

(2.) A candidate who presents the certificate of competency in the subjects of Part I., required from candidates at the junior non-professional examination for teachers, and also a certificate from the Principal in whose school he took the Middle School course for High Schools, that he has completed satisfactorily the courses prescribed therefor in Arithmetic and Mensuration, English Grammar, Geography, and British and Ancient History, may be admitted to the senior non-professional examination for teachers, without passing in the subjects of Part II. of the junior non-professional examination.

NOTE.—The course for this examination is a two years one, and the division of the examination into two parts will allow such candidates as may wish to matriculate to complete their languages with Part II.

## III. LOCAL (DISTRICT) TEACHERS' NON-PROFESSIONAL EXAMINATION.

8. When, in the opinion of the County Board of Examiners, the standard of the junior non-professional examination for teachers is too high for the condition of the county or any part thereof, the Minister of Education may authorize the issue of local certificates, but the examinations therefor shall be held only in such counties, and the professional certificates based thereon shall be valid only for such schools, as each County Board may designate. The report of the Board shall set forth in full detail the reasons for the Board's recommendation, and, in particular, the assessed value of the school sections concerned.

9. The examination for local certificates shall be in two parts on the following subjects of the Lower School of the High School:

PART I.—Reading, Book-keeping and Commercial Transactions (First Course), Art Subjects (First Course), Elementary Science.

PART II.—English Literature, Geography, Spelling, Composition, English Grammar, British and Canadian History, Arithmetic and Mensuration, Algebra and Geometry



(1) On the subjects of part I, a certificate shall be submitted to the Public School Inspector, as in the case of the junior non-professional examination, from the Principal of the school the candidate last attended; and the candidate will also present a certificate from the same Principal that he has read carefully at least four suitable works in English literature in addition to those prescribed by the Education Department.

(2) The course in English literature will be prescribed by the Education Department, and the Departmental examiners will set the papers and settle the results as heretofore. But the County Board of Examiners shall, as at present, settle finally the results of the examinations of teachers in localities where French or German is spoken in addition to English.

### GENERAL.

10. (1) No candidate who shall not have completed the seventeenth year of his age before the close of the examination, shall be admitted to any of the non-professional examinations for teachers. See Reg. 7 (2).

(2) When the application of the candidate for admission to the Junior or the Senior non-professional examination, or the examination for Local certificates shows that he has not been prepared in a High, Public, or Separate School, the Public School Inspector shall at once report the circumstances of the case to the Education Department, which will make such arrangements for a special examination in the subjects covered by the Principal's certificate as may be deemed necessary.

(3) The standard for the non-professional examinations for teachers shall be 40% on each paper and 60% of the aggregate of marks at each examination.

(4) At the different examinations a more exact knowledge will be required from the candidate than heretofore, and the examination papers will be constructed accordingly.

(5) The results of the non-professional examinations for teachers will no longer be published in the Toronto newspapers. Other arrangements will be made for communicating the results to those concerned.

### INTERIM PROVISIONS.

11. After July 1st, 1903, the examination for a commercial diploma will be no longer held; and, as announced in July, 1902, the examination for Junior Leaving Pt. I. (the Public School Leaving) has been abolished.

12. At the examinations of July, 1904 and 1905, a candidate for the junior non-professional (Junior Leaving) examination who selects the Chemistry option, may omit Latin; but he will be required, if he exercises the privilege, to obtain 60 per cent. of the total.

13. At the examinations of July, 1904 and 1905, all candidates for the junior non-professional (Junior Leaving) examination will be required to pass an examination in Geography and British history, in addition to the examination in the subjects for Part II. under the regulations of 1902. In the other subjects of Pt. I. Junior Leaving (Reading, Drawing, Book-keeping, Botany or Agriculture) a junior non-professional certificate will, in 1904, give full standing, if endorsed and certified to by any High School Principal or Public School Inspector, with a statement to the effect that the holder has taken the prescribed course in these subjects; but, at the examinations of 1905, the candidate will be required to present a certificate that he has completed satisfactorily the courses in the High School Lower School in Book-keeping and Commercial Transactions, Reading, Art Subjects, and Elementary Science (See Reg. 6 above).

14. At the examinations of 1904 and 1905, candidates for Local (District) certificates shall present the certificate required from the candidates for teachers' non-professional certificates under Reg. 13 preceeding, and, in addition, shall pass an



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examination in the following subjects as defined in the present courses for Forms I. and II. of the High Schools :—English Grammar, English Literature (authors to be prescribed by the Department), English Composition, Arithmetic and Mensuration, Algebra, Geometry, History, Geography, and Spelling.

**15.** The new High School courses, with the special regulations appertaining thereto, shall go into full operation in September, 1904, and thereafter the non-professional examinations for teachers will be held thereon; but, as already announced, the new examination scheme of subjects for non-professional certificates shall not go into full operation until after July, 1905, except as provided in Reg. 13 preceding; and, at the examinations of 1905, Regs. 6 (3), 7 (1) and 9 (1) preceding shall go into effect.

**16.** The new scheme of Public School courses and the special regulations appertaining thereto shall go into full operation in September, 1904, and the new provisions for the High School Entrance examinations in 1905.

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